



CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

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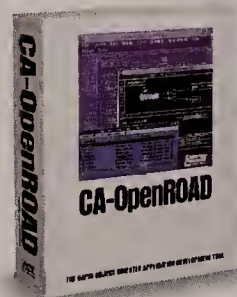
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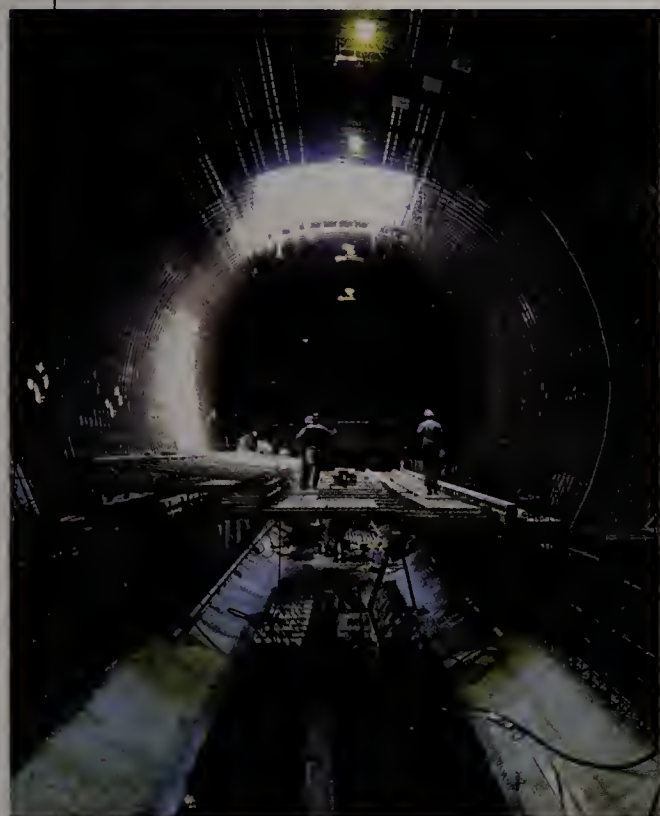
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CIO

VOLUME 8, NUMBER 8



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Beneath the Big Dig

Boston's Central Artery Project has introduced some radical techniques to American civil engineering—as well as what may be the discipline's most powerful and densely linked information environment ever.

By Fred Hapgood

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Cover photo by
Andy Ryan*



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Playing To Win

There are two sides to every negotiation. This is the story of one of those sides. We asked CIOs and expert negotiators to suggest strategies for wringing the greatest possible value out of every vendor contract. Is there something to be gained in a zero-sum game?

By Mickey Williamson

PARTNERSHIPS

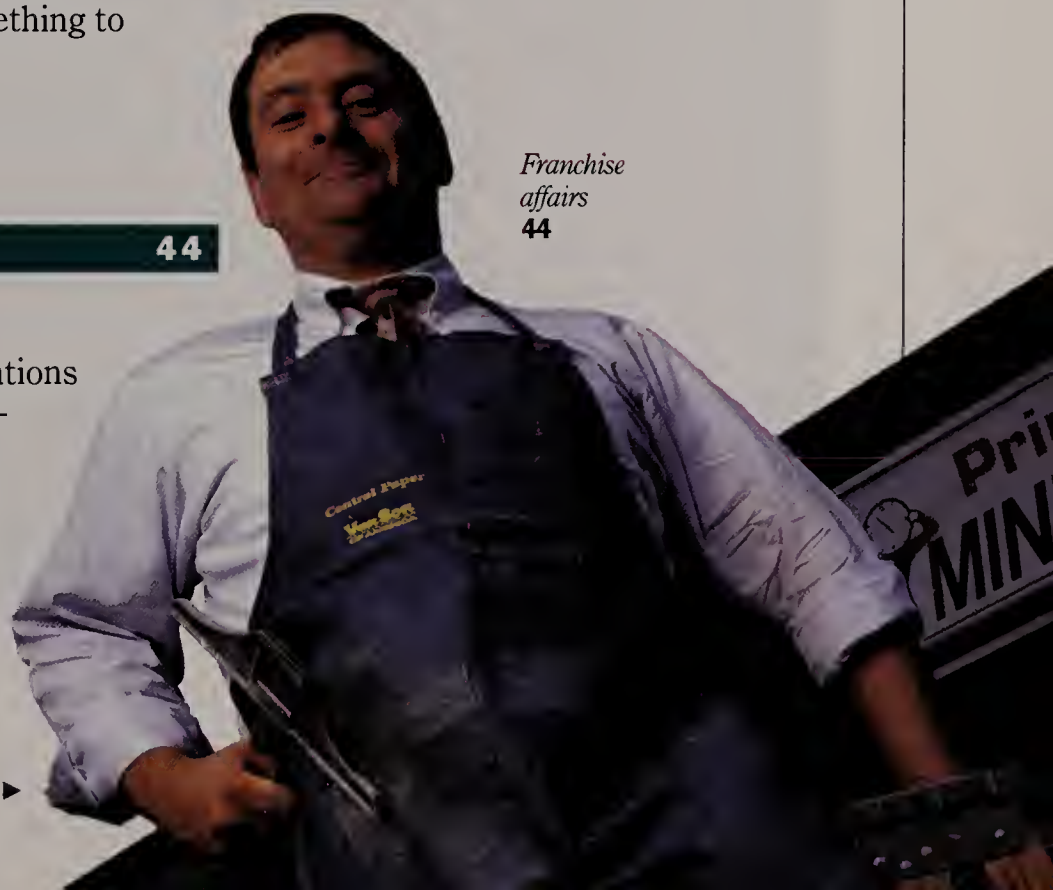
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Franchise Players

The business goal in the world of franchise operations is to leverage economies of scale in assuring consistent quality, agreeable customer experiences and top-notch operational practice among many small, widely scattered outlets. How does IT help franchisors deliver solid support to franchisees?

By Mickey Williamson

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MORE ►►►

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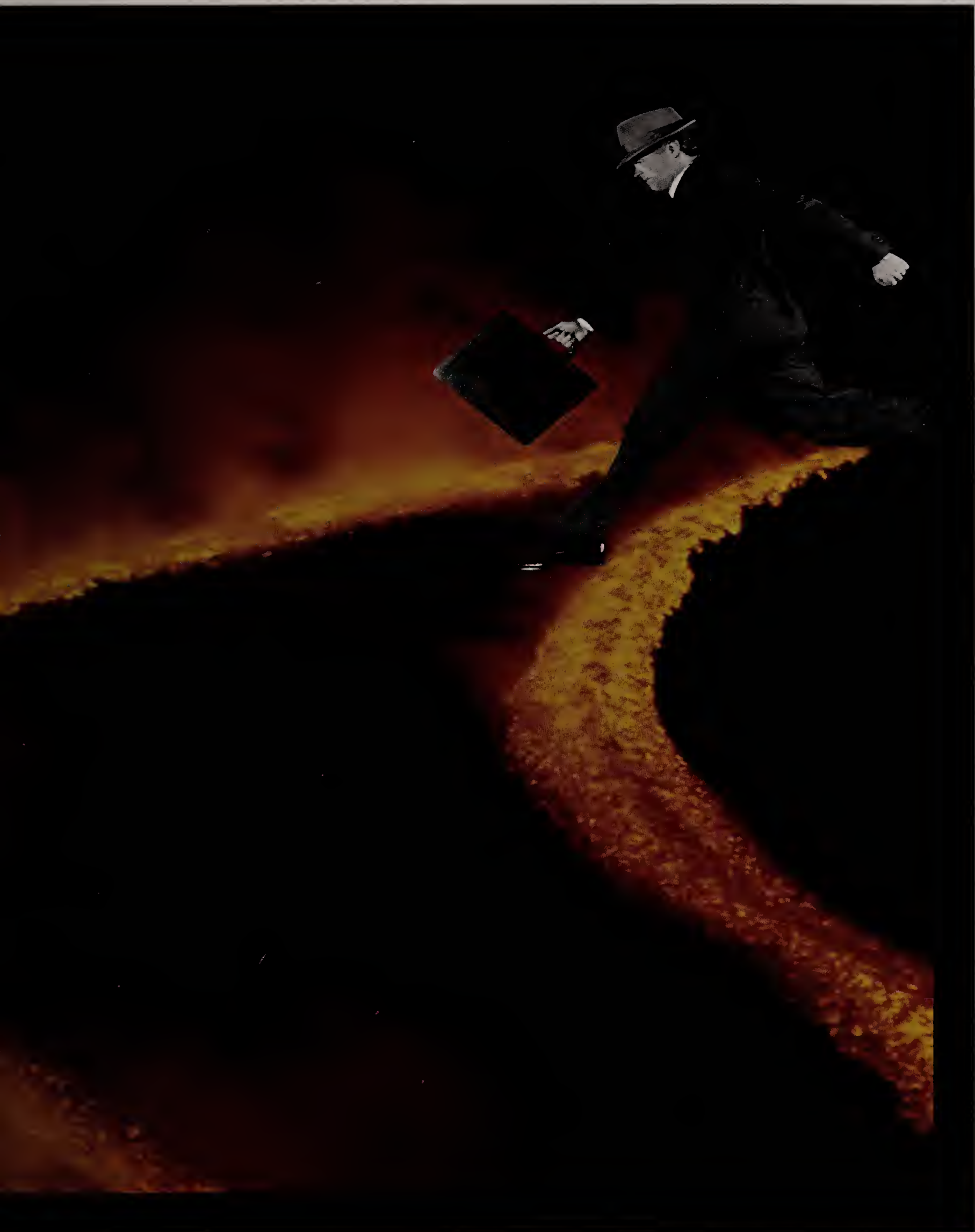
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Computer Systems



FEATURES (CONT.)

TELECOMMUTING

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Getting the Home Fires Burning

As the reasons for telecommuting become more compelling and tales of successful trials make the rounds, CIOs have to determine their role in ensuring their companies' success.

By Tracy Mayor



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FIRST PERSON: TIGER TEAMS

Technology is often blamed for the failure of client/server projects. Yet it is usually the lack of people with the right skills that causes things to fall apart.

By Larry Runge



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WORKING SMART: A LANDMARK SYSTEM

An archaic process and mountains of paper were obstructing Norfolk Southern's ability to sell or lease its land. Thanks to a combination of reengineering and IT, the firm has found real-estate relief.

By Peter Fabris



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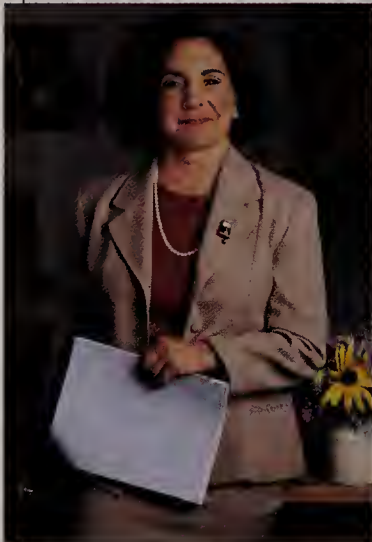


The more valuable a computer network is to a business, the more of a headache it can be to the people who oversee it. You have talented people. Problem is, your networking staff is too busy taking care of day-to-day troubleshooting and reconfigurations to even think about such things as expansion and migration planning. Fortunately, there is relief — Cabletron's SPECTRUM advanced network management platform.

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This issue of *CIO* clearly demonstrates the impact of information technology on the way we now live and conduct business.

In "Getting the Home Fires Burning," beginning on Page 52, Contributing Writer Tracy Mayor notes that a variety of forces, including government mandates for decreasing automobile emissions, are fueling a rise in telecommuting. Market research shows that an estimated 5.6 million individuals work at home at least three days a month, up a little more than 10 percent from last year's estimates. Such new-wave work patterns have been most successful to date at small firms and typically favor workers who are accustomed to little direct supervision, such as research scientists or middle and upper managers who perform a variety of tasks.

In order for the work-at-home trend to take hold, larger companies have to adopt telecommuting strategies, and a wider range of job types must be accommodated. As interest in telecommuting increases, IS executives are looking into developing systems for home use; they see ISDN, EDI and even imaging systems as technologies that will aid in this effort. Better security products and help-desk support will also play a large role in successful telecommuting solutions. Our article delves into the thinking of many information executives on this promising corporate work ethic.

In a similar vein, our article depicting the technology used in Boston's Central Artery Project highlights the type of information system that is—quite literally—breaking new ground. (Please see "Beneath the Big Dig," which begins on Page 34.) Heralding a new era in civil engineering, this innovative project incorporates such technologies as an object-oriented design language, 3-D computer-aided design techniques, geographic information systems and expert systems to ease traffic patterns in the Cradle of Liberty's jumble of old buildings and labyrinthine streets.

As the influence of information technology on our society continues to grow, so too must the role of the CIO. Incorporating technology into existing enterprises without major disruption requires vision and expert sales abilities, expanding duties for the astute information executive and his or her peer partners.

Marcia Blumenthal



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"Since the industrial revolution, we've been working 9 to 5 or 8 to 5. Now management has to change its paradigm."

—Martin Pospeshil
Manager of Alternative Officing Strategies
AT&T Global Real Estate division

Will the 9-to-5 workday go the way of 8-track tapes as corporations embrace virtual offices and flexible work schedules? Well, not exactly, but as companies seek ways to comply with the Clean Air Act, lower real-estate costs and offer employees alternative scheduling, we will witness more and more

innovative work programs that prove that workers can be productive when they telecommute and work nontraditional hours. The key to maintaining high levels of productivity in a telecommuting environment is to involve the CIO as early as possible in the planning stages.

As telecommuting programs graduate from trial experiments to departmentwide usage, the incidence of error can be costly. Hardware and software standards must be implemented. Training is essential. And security measures must be taken seriously. "Getting the Home Fires Burning" (beginning on Page 52) explores the pros and cons of telecommuting and offers sound advice both for readers who have programs underway and for those contemplating telecommuting.

With some 5.6 million workers laboring at home and that number growing every day, modem, ISDN, EDI and telecommunications-software vendors should be taking a serious look at this hot market. My advice to them: Don't just sell the products, sell the benefits of telecommuting—less office space to rent, flexible time for employees and a positive impact on the environment.

Wynne L. Lutz

P.S. James A. Champy will be the featured keynote speaker at the March CIO Perspectives conference, "Managing IT in the Reorganized Enterprise." The conference will take place March 12-15 in Rancho Mirage, Calif. Please call us toll free at 800 366-0246 to make your reservation.

Coming In CIO

SPECIAL ISSUE: Achieving Software Quality

Help Wanted

Everyone knows the many benefits of client/server systems. But programmers who can really deliver them are few and far between. What can CIOs do to find the programming wizards they need?

High Five

Carnegie Mellon's Software Engineering Institute unveiled its five-point Capability Maturity Model (CMM) in 1991. Using interviews, questionnaires and the CMM as a benchmark, evaluators grade the ability of a programming team to create predictable software that meets customers' needs: Level one is chaos, level five is perfect control and predictability. The majority of organizations rated so far are stuck at level one, but a few have achieved level-five status. We'll take a look at one of those success stories and extract lessons that can benefit any company.

Expert Advice

Experts agree that the road to client/server is full of pitfalls, but those who navigate the path successfully will find at its end business benefits that can be achieved in no other way. In order to explore the ins and outs of this most complex of computing architectures, CIO assembled a panel of experts and asked them to discuss the issues involved in bringing robust, reliable, business-savvy client/server systems into existence.

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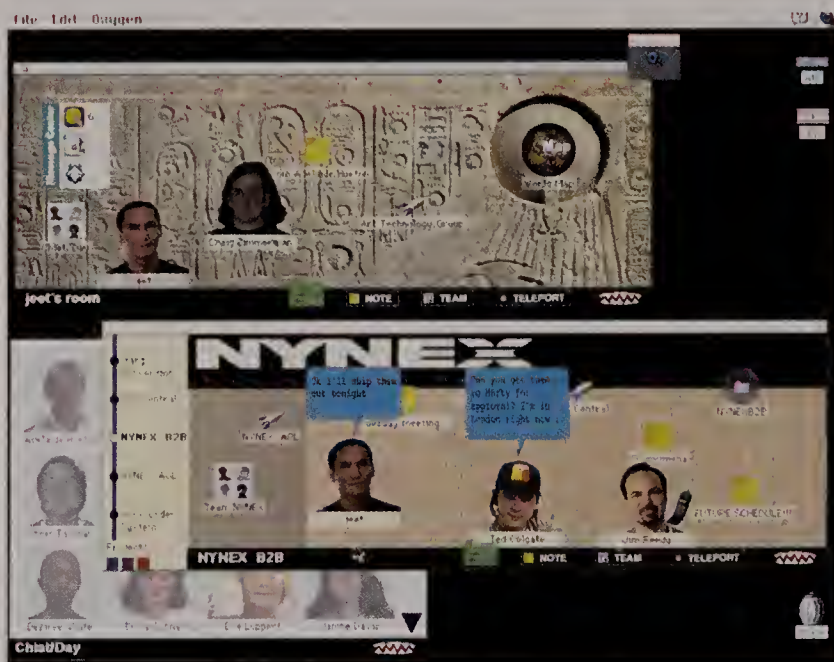
THERE'S NO PLACE LIKE NO PLACE

Let's say somebody in the Venice, Calif., office of Chiat/Day wants to meet with a couple of somebodies in the prestigious ad agency's New York headquarters office and with another somebody at the Boston-based Art Technology Group. But nobody wants to travel. They can't videoconference. A telephone call won't do, either.

So instead, they call a virtual meeting, and without leaving their PCs, they gather in somebody's office. They can even see each other's faces. Sort of.

What makes it possible is Oxygen, a groupware program ATG initially designed for Chiat/Day but now hopes to market to other firms.

To understand Oxygen, you have to first understand Chiat/Day. The maverick agency, whose major clients include Eveready, Nissan, Nutra-Sweet, NYNEX and MTV, gets almost as much attention for its pioneering efforts to replace the traditional workplace with a more cooperative, futuristic



environment as it does for its ads. Armed with mobile phones and laptop computers, Chiat/Day employees share space at headquarters or stay in touch from home,

client offices or on the road.

Oxygen binds it all by letting people work together even if they're geographically separated. The software represents each person as an

icon, using a scanned-in photograph of the person's face. Users, who can dial in from anywhere, move from room to room by clicking on and dragging the photo icons. During real-time meetings, they "talk" by typing messages; the text appears in cartoon-like balloons above the icons' heads.

If employees need to know a co-worker's physical location, they just click on the user's photo. Telephone icons appear when someone is making a call. Oxygen also lets employees telephone each other, routing calls to the right people no matter where they are.

—Anne Stuart

SHOOTING FROM THE BLIP

The cops on TV make it look easy—taking out bad guys who are shooting at civilians from rooftops or firing their subautomat-

ics as they dodge behind parked cars. But if you've ever been in a real gunfight, you know that it's almost impossible to return fire—let alone hit anybody—when you can't tell where the bullets are coming from.

The Lawrence Livermore Laboratory is addressing that problem with a system, called Lifeguard, that tracks flying bullets on a computer screen. According to *Government Technology* maga-

zine, the system, which was developed in response to a number of school shootings, uses a special sensor that attaches to a rifle like a



scope. The sensor emits ammunition-identifying signals; these are processed by a portable computer that then traces the bullet's flight path back to the source. "Anybody who shoots at you from any direction would be immediately located and subject to return fire," says Thomas Karr, head of the Lab team that developed the product. "The aggressor can no longer hide."

A WHOPPING BIG BILL

According to *The Economist*, Bill Gates' entry in Microsoft's interactive encyclopedia Encarta is longer than the entries for Chinese Premier Deng Xiaoping and Health and Human Services Secretary Donna Shalala combined.

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GARBAGE AT THE SPEED OF LIGHT

For many, E-mail is not a productivity tool; it's just another boulder in an office info avalanche. Used effectively, E-mail promotes efficient interoffice communication. But poorly written electronic messages can gum up the gears of an otherwise smoothly run operation.

Poorly written E-mail is simply "sending garbage at the speed of light," says Deborah Daw, vice president of Better Communications, a business-writing consulting firm based in Lexington, Mass. That's not only harmful to business efficiency, but can also damage the sender's career if the recipient misses important points due to murky prose.

When Daw talks about poor writing, she isn't referring to a misspelled word here or a dangling modifier

A PROMISING FUTURE

Microsoft's Windows NT Server operating system is expected to make a strong showing in the database and application server market by 1996, according to Forrester Research Inc. of Cambridge, Mass. Ten percent of 50 Fortune 1000 companies interviewed by the firm say the one-year-old operating system is already a standard within their companies, and 34 percent say it may become a standard by 1996 provided testing of the latest version goes well.

Richard D. Buchanan, author of the report, says that companies struggling to make sense of the Unix world see two advantages to NT. "First, one piece of code will run across many

there. The issue is concise, effective communication that keeps the needs of the reader, not some junior-high-school English teacher, foremost in mind.

"This isn't a grammar issue," Daw says. "It's a

strategic planning issue." Information executives can "significantly increase productivity if they take this seriously."

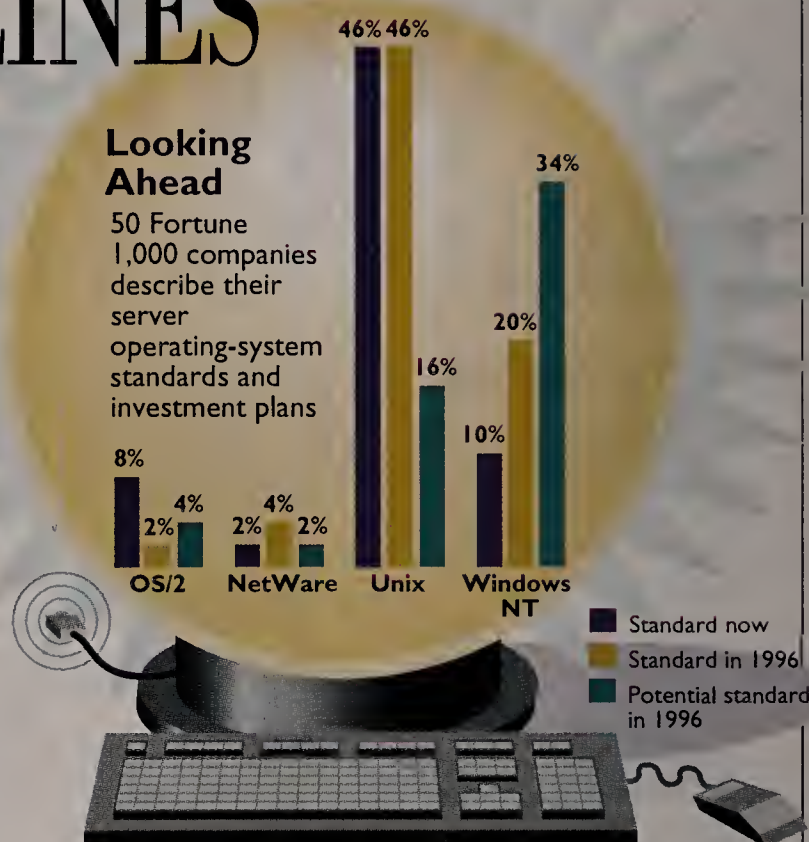
Daw's firm has been teaching effective writing to corporations for 15 years. It started out focusing on internal memos and technical reports, but in recent years E-mail has come to the fore. At least half of course time is currently devoted to it.

In some ways, E-mail makes it more difficult for executives to communicate than the old-fashioned paper memo did. "In the old days, at least the secretary would take a

different platforms. They will not have to choose between hardware-specific versions of the operating system. Second, Microsoft's huge market presence will spur ISVs to write innovative applications for NT, before they sort through the Unix politics."

Looking Ahead

50 Fortune 1,000 companies describe their server operating-system standards and investment plans



Source: Forrester Research Inc.

FREE STUFF

The Frame Relay Forum is offering free copies of its new applications guide to IS and network professionals. The guide includes 20 company profiles that describe business and technical challenges, as well as network topology diagrams. To obtain a copy, call 415 578-6998.

look at it before it was sent," Daw says. Now writers send their own messages the moment they are composed, with no assistant to filter out extraneous words or clarify unclear passages.

What are the keys to good E-mail?

"The words have to work and cause action or the document has no value," Daw explains. She suggests writing an action-oriented subject line such as, "We should

attend this conference," rather than just "Conference info." The subject line should be used like a newspaper headline—to grab



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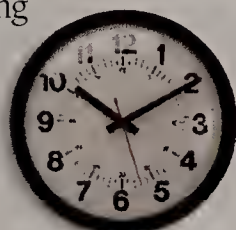
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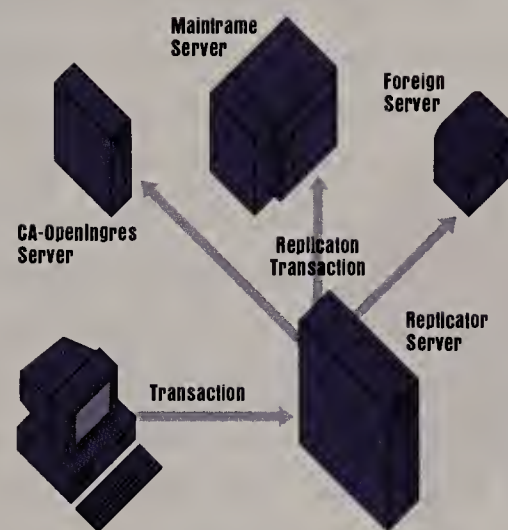
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In addition, subheadings and bulleted items help to focus the reader's attention on the main points of the communication. Above all, she advises, keep it short. An electronic message should

never be more than one page long. Anything more substantial is best conveyed on paper; that gives readers the option of reading it at home or while commuting by train. For more information, Daw can be reached at 617 862-3800. ■

—Peter Fabris

THE TRAGEDY OF ERRORS

Inaccurate information is bad for any industry; in medicine it's potentially life-threatening. But until recently, errors were common at the HLA Registry in Blue Ridge, N.J., where employees manually input data on more than 100,000 volunteers willing to donate healthy bone marrow to patients with blood-related diseases.

"The mass volume and complex nature of tissue typing and genetic data needed to match donors makes it difficult to manually key volunteer information into the system," says Dr. Elie Katz, president of the registry. "Input errors can result in mismatches, creating critical delays and false hopes for patients."

The solution: an image-processing system featuring scan controllers and software donated by Kofax Image Products of Irvine, Calif. The new system will allow the registry to scan 700,000 pages of donor medical history and blood-tissue-typing results into its PC-based LAN.

Genetic data on volunteers recruited through the registry will now be scanned into the system and forwarded electronically to a central computer at the National Marrow Donor Program in Minneapolis, a clearinghouse for patients and donors. To protect volunteers' privacy, the information is identified only by bar code. The originating registry is notified when a match is found; it must then verify the genetic data and inform the volunteer.

As the next step in developing a document-image-processing system, HLA plans to implement intelligent character recognition. By automatically reading handwritten medical and consent forms, ICR should further speed the process and reduce the probability of errors.

For information, call the HLA Registry at 201 487-0883. ■

LIBERATING TECHNOLOGY

If the war in Bosnia has shown up the weakness of NATO and the U.N., it has also highlighted some of the strengths of videoconferencing. Several groups committed to fostering international understanding through technology are enabling people in the besieged town of Sarajevo to communicate their trauma to the outside world via satellite video technology.

The nonprofit Global Interactive Plaza Foundation and the Hollywood production company Mirror for Humanity recently installed a videoconferencing facility in Sarajevo with the goal of "ending violence through worldwide communication and the awareness it can generate of a tragic reality,"

according to the Foundation's co-chairman, Joseph Goldin. Last November, the two groups sponsored a videoconference among artists, scientists and others in Sarajevo, Paris, Moscow and Santa Cruz, Calif. (VideoBridge International Corp. of Cambridge, Mass., provided a crucial link in the communications network and a staging area for the Moscow contingent.) The featured speaker was Suada



CAREER MOVES

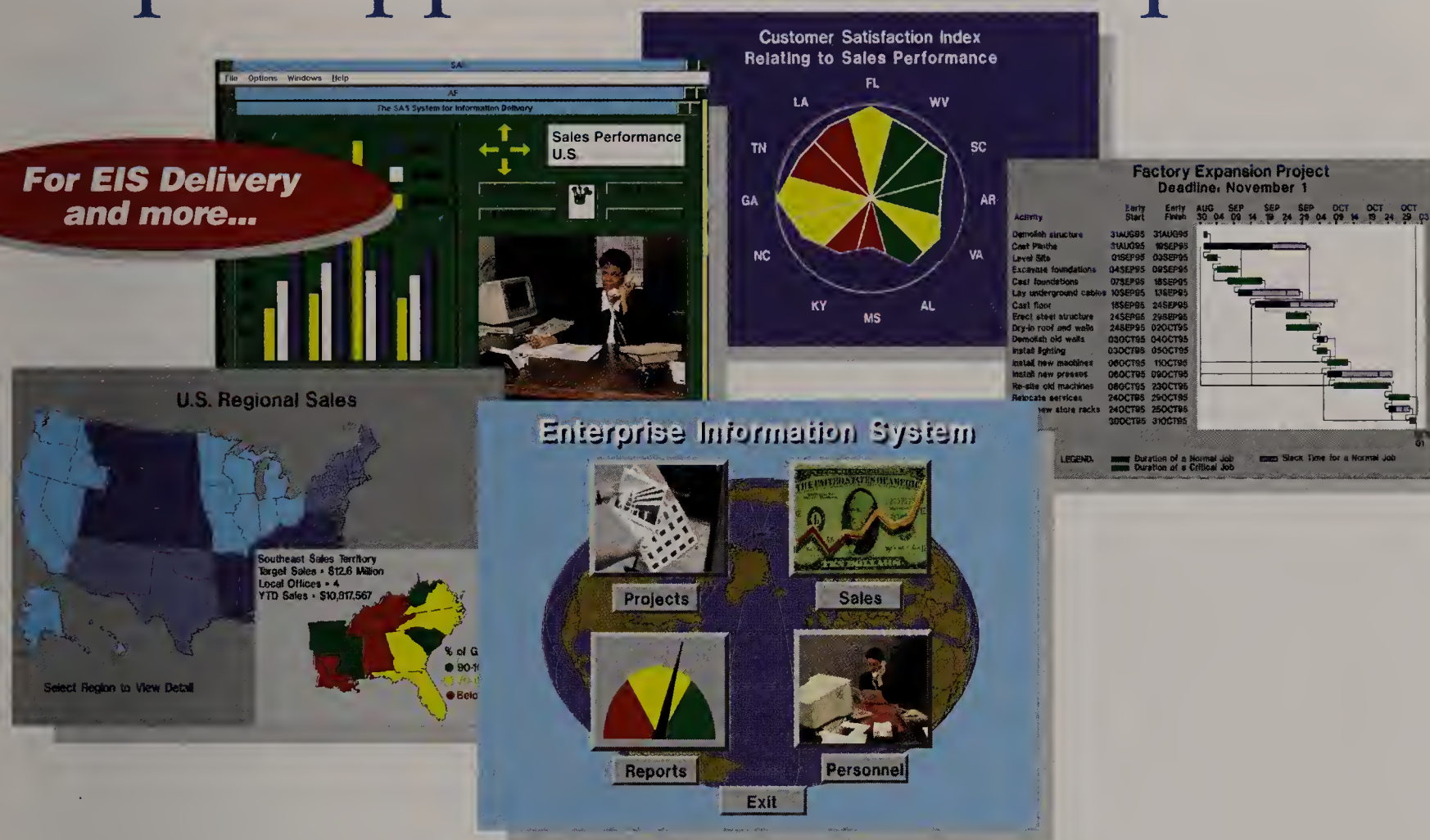
The New York Life Insurance Co. has named LEE LAPITOLI senior vice president and CIO. He will oversee application development, systems architecture and the strategic use of technology for all of New York Life's business units and corporate service areas.

Zale Corp. of Irving, Texas, has named PAUL KANNEMAN senior vice president and CIO. Kanneman, whose most recent position was associate partner with Andersen Consulting, is responsible for the company's management information systems.

JAMES M. LOGAN was recently appointed CIO and senior vice president at Metropolitan Life Insurance Co. in New York. Logan is responsible for spearheading MetLife's information-technology initiatives and coordinating the use of technology corporatewide. ■

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Kapic, artistic director of the Sarajevo Arts Festival and founder of the city's Museum of Survival.

The Foundation and Mirror for Humanity see the use of compressed video technology as a way to "liberate" captive populations. The facility in Sarajevo is only the first step in their plan to build a network of permanent "interactive plazas" throughout the world. ■

WELCOMING THE FLEET

It's no secret that technology can do wonders for a company's competitiveness, and now we can thank IT for something else as well: nearly all the new jobs that have recently been created in the United States. A new breed of company known as a "gazelle," which uses IT and innovative organizational structures to produce things faster, better and cheaper, has emerged over the last five years and is responsible for the majority of new U.S. jobs, according to the Council on Competitiveness, an industry group based in Washington. The progressive firms represent 3 percent of all U.S. companies and can be found in every industry and region of the country.

TAKE THIS JOB AND CHANGE IT

It's often said that change is the only constant in the business world, and apparently the CIO role is no exception. According to John J. Davis & Associates Inc., a New York-based firm that specializes in IT recruitment, three out of four senior IT posts filled today are newly

restructured positions. By contrast, as recently as two years ago this was true of only 40 percent of senior IT jobs.

Why the change? According to the recruiter, senior management now uses the opportunity of an opening in such a position to revamp its objec-

tives and responsibilities to better suit evolving corporate strategy. Specifically, changes generally involve a broadening of responsibilities, often to include greater emphasis on strategic uses of information technology and on the role of translator for the user community.

According to the recruiter, the following are among the most sought-after attributes in a candidate for a senior-level post:

- The ability to articulate a vision for technology enterprise-wide;
- The ability to drive and manage change; and
- A talent for assessing employees' skills and building effective teams. ■



EVENTS

1995 Annual HIMSS Health Conference and Exhibition:

Rethinking the Delivery System
Feb. 12-16
San Antonio Conference Center, San Antonio
Healthcare Information and Management Systems Society (HIMSS)
312 664-HIMSS

This five-day event will feature workshops, educational sessions and more than 250 exhibitors. Workshops will focus on community health information networks, telemedicine, health-care reform issues, managed care and health care in Latin America. Registration: \$895-\$1,195

The Sixth Annual International Help Desk Conference

March 5-8
Moscone Convention Center, San Francisco
Help Desk Institute
800 248-5667

This conference will include seminars, case studies and open forums that examine issues of importance in planning, implementing and supporting help desks or related services. More than 150 exhibitors are expected to attend. Registration: \$895-\$995

UniForum '95

March 14-16
Dallas Convention Center, Dallas
UniForum Associates and The Interface Group
617 449-6600, ext. 4023

Business and IS executive attendees will explore the latest open-systems products, services and solutions from more than 400

vendors. Sessions, tutorials, workshops and keynote presentations by leading industry executives are designed to provide perspective for business, technical and distribution professionals. Registration: \$695-\$1,395

Focus on Operations-XV and IS Expo

March 19-23
Las Vegas Convention Center, Las Vegas
Association for Computer Operations Management (AFCOM)
714 997-7966

Focus on Operations-XV is geared toward professionals managing mainframe, midrange and client/server data centers. More than 150 vendors will exhibit at the concurrent IS Expo, where product information sessions will also be offered. Registration: \$695-\$1,140

2001: Information Management for the Next Century

March 27-28
The Wyndham Paradise Valley Resort, Scottsdale, Ariz.
Decision Support Technology
800 288-5434

World-renowned authorities speaking at this event will discuss how to spot trends in information delivery that will shape decision-support systems, executive information systems and data warehousing in the future. In addition, the event will also feature a technology showcase, a reception, peer-group luncheons and vendor exhibitions. Registration: \$995

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Tiger Teams

Technology is often blamed for the failure of client/server projects. Yet it is usually the lack of people with the right skills that causes things to fall apart.

BY LARRY RUNGE

Making the transition from a host-centric environment—where tools, techniques, skills and methodology have not seen drastic change since Admiral Grace Hopper's team developed the Cobol programming language in the 1950s—can daunt even the most intrepid of innovators. An organization can, however, voyage from the old technological world to the new without drowning everyone in the ensuing morass of change by taking a simple, effective three-pronged approach to building its client/server development teams:

Hire as many people as your budget will allow who already have the skills you need. What you want are barnburners, people who fly so fast and low that they set the barn on fire when they pass. Don't consider anyone who isn't coming hot off a successful client/server project. Personality, however, is every bit as important as technological talent. These people need strong interper-

sonal skills, leadership abilities and, most of all, enthusiasm—because you're going to seed your organization with them. This will greatly reduce the amount of time it takes to get a new team up to speed.

Because these new hires will be your change agents, you need to get to know them personally. Instruct them to come directly to you if they run into organizational roadblocks. The best will have strong personalities, with egos to match; managing them will be like herding wild horses. But if you do it well, they will carry your organization fast and far.

How do you justify the extra head count? First, "legacy" individuals who just can't—or who refuse to—adapt to the new technology will leave during the first six to nine months of the transition. Second, a healthy IT organization will have a normal employee-turnover rate of 10 to 15 percent a year (any less suggests inbreeding and stagnation). Hire only people with new skills to replace those who leave. Third, large reengineering projects always require additional staffing. Rather than beefing up exclusively with contract workers, hire full-time people with the skills you need, then use normal attrition to level your head count once the reengineering project has finished.

Immediately bring in contract personnel with the requisite skills and experience to get things rolling. As any sort of IT outsourcing is an act of desperation, you should contract for individuals to work on your projects rather than handing over entire projects to an outside company. Cherry-pick these hired guns, and throw them on your hottest projects.

Look for people just coming





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"...The hinge of radical change almost always swings on new information systems."

— James Champy, Chairman
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off a client/server project. Client/server technology is changing at a furious pace and generally has a half-life of 12 to 18 months. If at all possible, get people whose skills are fresh.

Don't differentiate between internal and external personnel, except in the area of training (generally, contractors should be responsible for their own training). Invite the contractors to the company picnic and all-hands meetings, and treat them like your own. What you want and need is a cohesive team, not camps of us and them.

Don't have your own staff interview potential contractors unless they have advanced-technology skills themselves. If you do the interviews without these skills, you're just as likely to end up with a smooth-talking plumber as you are a client/server guru. Consider bringing in a scarred veteran or two from companies like Keane, Revere, TSC or Andersen Consulting to do the interviewing. Always check references.

Give preference to companies willing to let you later hire the contractors you bring in. This is an excellent way to try before you buy. The finder's fee in these cases should be no more than what you would pay to a good headhunter.

Begin aggressive training of your internal staff. Expect to double or triple your training budget for those undergoing technology transition. You may need four to six weeks of training, per person, over the first 18 months of the conversion. Even with advanced development tools, changing from a procedural programming environment to one that is event-driven is a challenge. It will take an average of 11 months to turn a good Cobol programmer into a good client/server programmer.

Introduce your most enthusiastic workaholics to client/server by putting them on pilot projects with experienced people and having them do the go-fer and mundane chores such as Cobol coding and data-extract programs. After sending them to school to learn the GUI language and operating system, put them on a project where they'll learn how to

use remote procedure calls and segregate an application into its constituent client and server parts. Finally, send them out for advanced training and give them key assignments on new projects, letting them serve as mentors to others just learning the technology.

Introduce your most enthusiastic workaholics to client/server by putting them on pilot projects with experienced people and having them do the go-fer and mundane chores such as Cobol coding and data-extract programs.

Save your tenacious dinosaurs—those who learned truth in 1972 and haven't changed their minds since—for last. If you're lucky, they'll leave the company before you get to them.

Finally, send your top guns to seminars and conferences on client/server technology. Seek out sessions where the speakers are professional developers who have actually been in the trenches. This will expose your folks to a lot of new ideas, and the ability to network with other developers can prove invaluable. Send each to different conferences to broaden your organization's exposure to new ideas.

There will always be resistance to change. The real resistance will come not from the rank and file—most of whom will embrace the change enthusiastically—but from your middle managers and direct reports. Although their opposition will be subtle, steel yourself to wielding the scalpel or doom your transition to a lengthy, painful—and very expensive—death.

Beware of "crabs": people who can't move forward, only sideways and backward. If there's a basket full of crustaceans and one attempts to crawl out, the others will grab it and drag it back down to their level. Identify the crabs and toss them over the side of the boat.

Not everyone will be able to make the transition, and not everyone will want to. These people will not be successful or happy in your organization, so it's best for everyone if they leave. Expect turnover to be as high as 30 percent over the first two years. To quote Sir George Savile, Lord Halifax, "The third part of an army must be destroyed before a good one can be made out of it."

Age will not be a factor in the ability of your technical staff to adjust to change. I've seen die-hard programming Luddites in their 20s and innovative, hard-charging change agents in their 60s. Look for energy and enthusiasm—not specific birth dates.

Don't let internal politics ("Hey, our own folks should get first shot at this!") doom your initiative. The systems organization isn't a social club; it exists to help the business make a profit. Remember, you may be the one to lose your job if things screw up royally. You owe your first loyalty to the business that hired you.

Your first project must be highly visible, and it must exceed the expectations of all involved (not hard to do, if you're coming from a main-frame-only environment). You cannot afford to fail on this one, nor can you afford to just do well. This must be a wild success. Success will immediately quiet all but your most vocal detractors. It will demonstrate to the entire business that this brave new world is a fine one, indeed, thus garnering support for future endeavors. It will also have your best people champing at the bit for the chance to succeed on their own projects. **CIO**

Larry Runge is vice president and CIO at Wheels Inc. in Des Plaines, Ill. He has implemented over two dozen client/server projects at several different companies.

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**CIO Magazine* 1994 Readers' Choice Awards.

Playing To Win

WHEN CIOs NEGOTIATE WITH SUPPLIERS, the stakes are hardly trivial. New-age management gurus may speak of negotiations in which everyone leaves the bargaining table happy, but some experts doubt that anything short of the "zero-sum game" of the 1980s is possible. The win-win notion is "a weak alternative," according to Jim Morgan, editorial director of *Purchasing* magazine in Newton, Mass. "When [nonexpert] negotiators get involved, they're so busy finding a solution that both can live with that they miss picking up all the dollars out there on the table."

A good negotiator comes to the bargaining table with an agenda and the determination to win as much as possible, Morgan says. "Negotiations are about winning; to make the other person in the negotiation happy is a secondary goal."

Peter Bates was determined to win when he sat down with his company's hardware vendor to discuss an upgrade. "The time had come to move up to a higher-level system," recalls Bates, who was then the vice president of IS and CIO for PC reseller BusinessLand (now called Entex Information Services) and is now the vice president of systems and CIO at clothing manufacturer Esprit de Corp in San Francisco. "We weren't happy with the performance of our computer system, nor with the way in which the vendor maintained it. We had pretty much decided to change vendors," he says. "We told the hardware vendor's sales representative, 'You didn't perform, so we're going to move on.' The salesman replied, 'What would

it take for us to keep your business?'

"Always be prepared for that question and try to have a creative answer ready," Bates advises. In this case, he was ready: His company would stay with the original vendor only if it would provide an extra processor and backup disk capacity at no extra charge—increasing the value of the configuration by about 30 percent, Bates estimates.

"The sales rep blinked and said, 'I'll get back to you,'" Bates says. "He came back and said, 'I can't get the company to sign for that on an official contract, but I'm prepared to give you a letter of agreement from my branch office that says we'll do it.'" Imagining the trade-press headlines that would result if the vendor invalidated a branch manager's contract—"Branch Manager Gets Fired and Customer Throws Out Vendor"—Bates accepted the deal.

A year later, the vendor hired a new sales manager, who challenged the branch manager about the contract. The computer maker took the position that the contract applied to the first year only. "Clearly we didn't intend for this to go on beyond a year," Bates recalls being told by the firm's vice president of sales. "Maybe you didn't, but we sure did," Bates replied. Believing the vendor could not afford the bad publicity that would result from terminating the contract, Bates told the company's representatives, "We're sticking with this. As far as we're concerned, a deal is a deal."

In carrying out this successful negotiation, Bates' former company followed the first rule that every Boy Scout learns: Be prepared. The compa-

STORYLINE

There are two sides to every negotiation. This is the story of one of those sides. We asked CIOs and expert negotiators to suggest strategies for wringing the greatest possible value out of every vendor contract. Is there something to be gained in a zero-sum game? We invite technology vendors to respond with their own perspectives on the negotiation process.

BY MICKEY WILLIAMSON



ny was able to state the problem clearly and to offer a solution. Negotiators had a clear understanding of what was important to the company and a good sense of the vendor's priorities. "It isn't always getting the highest price," Bates says. "It may well have to do with reputation. It's important to understand what makes the vendor tick, what the hot buttons are, what the easy and the hard things are—for the vendor as much as for yourself. You've got to be prepared to concede on the things that don't matter to you and to be very tough on the things that do matter."

It also helps to know what is possible and what is not, says Robert Fine, vice president of MIS at Con-Agra Frozen Foods in Omaha, Neb. "I try to have a comparison with an-

the upgrade was so expensive," Ryan says. "But when you do that, you have to do it very sincerely. You can't be bluffing."

Ryan relates an instance in which the vendor's sales representative called the company's technical staff and was told, "This guy Ryan is going to throw your product out. He's really testing other software." When that happens, "the vendor gets religion," Ryan says. "They figure that some money is better than no money." The result: Ryan got the deal he wanted.

Everything is negotiable, experts agree, particularly when the purchase involves commodity products. In buying packaged software, Bob Ferkenhoff, vice president and CIO at SPS Payment Systems Inc., a

just such a merger. Ryan also shoots for an "enterprise license," one that is good not only for the current hardware platform but also allows use on any machine the company may acquire in the future. "Usually there is a significant charge for that," he says, "but you certainly have to ask for it."

Nowhere is the old saying, "If you don't ask, you don't get" more true than in bargaining with a supplier. Brzezinski learned some of his negotiating techniques from a former boss, a vice president at Chicago Northwestern Railroad who has since retired. "He'd just keep asking," Brzezinski chuckles. "When some people ask, it sounds like a joke, but he was always very serious." Brzezinski uses more humor in his own style: "I'll say, 'Wouldn't it be neat if I had this,' and laugh about it. At first the vendor treats it as a whimsical remark, but when you repeat it once or twice, they get the message."

Bargaining for services differs slightly from negotiating for commodities, many say. The service provider, whether outsourcer or consultant, may have specific skills that cannot be found elsewhere, in which case there will be little room to argue about price. "You don't beat your vendor into the ground if you want him to be your partner," says Brzezinski. "To do that and expect him to give you 110 percent is a mistake."

Fine agrees. "Don't drive the price down to the point where the vendor is going to have to sacrifice service," he says.

Indeed, just as customers can walk away from a deal if they aren't getting what they want, so can vendors. Lane Nonnenberg, general manager of Hewlett-Packard's Operations Services, an outsourcing company in Mountainview, Calif., stops short of saying that customers can be unreasonable in their expectations, but he acknowledges that sometimes "we just can't come to terms, and we have to be unafraid to cut the rope and just walk away from a deal." But there are things a services vendor can negotiate on to give

"It's important to understand what makes the vendor tick, what the hot buttons are, what the easy and the hard things are—for the vendor as much as for yourself."

—Peter Bates

other vendor so that I know if my expectations are realistic," he says.

Checking with other vendors has another benefit, too: It helps the customer deal from a position of strength. "You [should] constantly remind your favorite vendor that there's going to be competition," says Ron Brzezinski, principal at Transformation Associates, a management-consulting firm in Wilmette, Ill. [Some IS executives are finding that the Internet is a good way to stay informed in this respect (see "A Walk on the Wired Side," CIO, Dec. 1, 1994).]

Raymond Ryan, director of technical services at Trigon Blue Cross/Blue Shield in Richmond, Va., could hardly agree more. When faced with the prospect of a big bill for a software upgrade, "we have gone as far as evaluating other products and talking about dumping the vendor's product line because

Dean Witter company in Riverwoods, Ill., suggests that the prospective customer negotiate on maintenance and implementation support as well as price.

Maintenance fees are usually expressed as a percentage, but the critical question is, "a percentage of what?" says Fine. "Is it a percentage of the purchase price, or of the price of the product at renewal time? Can you get the vendor to agree to some growth factor, such as the consumer price index? Getting those technicalities right about a contract is extremely important, and I think many companies are caught by not doing that properly."

When negotiating a software license, CIOs do best if they are thoroughly familiar with their companies' future plans. "If you're in a company that is involved in acquisitions, then you want to aim for a multisite license," says Ryan, whose company has recently undergone

a lower price, he says. "We can negotiate away some deliverables and reduce the cost that way."

While trying to get what you want in a contract with a supplier often requires that the vendor's sales representative first check back with his or her superiors for approval, Ryan has an interesting technique for avoiding that process. "Most vendors come in with a standard contract that they don't like to change, because if they do then they have to run the changes by the legal department and that raises corporate issues," he says. Instead of requesting changes, Ryan comes in with an addendum listing "four or five things that we feel should be in a contract and usually are not. We tell the vendor that it supersedes their contract for these specific items," he explains. "Generally, the lawyers don't have to see the addendum. What you want to do is keep it at the level of the vice president of marketing, and the ad-

"You don't beat your vendor into the ground if you want him to be your partner. To do that and expect him to give you 110 percent is a mistake."

— Ron Brzezinski

dendum tends to do that."

One point in Ryan's addendum sets a cap on maintenance price increases. Another calls for an enterprise license. The third point calls for "no upgrade charges, period. Then we negotiate from there," Ryan says, adding that "some vendors are more open to this than others, but it's a place to start."

Noting that most vendors build discounts of 30 to 40 percent into their list-price schedules, Ryan suggests that it is often better to pay closer to list in return for concessions on maintenance and upgrade charges. "What vendors count on is

that at upgrade time, or when you're adding a new hardware platform, you'll be so focused on your own technology problems that you'll just pay the upgrade without thinking about it," he says.

Ryan also forbids his technical staff to accept evaluation copies of software because that would blunt his negotiating edge. Free software "usually comes in the back door through some systems analyst or programmer. Management knows nothing about it," he explains. The technical staffers "install it for 90 days, fall in love with it, and it suddenly becomes a necessity. The vendor knows it, and there's nothing to negotiate."

A Fine Line

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Part of the trick of negotiating successfully is recognizing that individual bargaining styles can vary widely

The "always ask for more" negotiating technique can go awry, as one of Ron Brzezinski's subordinates once learned. Trying to squeeze more out of a vendor that was selling a software package costing several hundred thousand dollars, the negotiator asked repeatedly, "What else can you offer me?" says Brzezinski, principal at Transformation Associates, a management-consulting firm in Wilmette, Ill.

The negotiator's style was to ask for something outrageous and see what the vendor would counter with. Warming to the task, he remarked at one point, "'Wouldn't it be nice to have a little sports car with this?'" Brzezinski recalls. "He was a totally ethical man and could have bitten his tongue when he said it. He came to me almost immediately and said, 'I think I just messed up.'"

But the vendor "was shrewd enough to recognize that it was just this man's negotiating style," he adds. "A week later, there came to his office a framed picture of the sports car for him to hang on his office wall. The vendor got the bid, first because he didn't make a scene, and second because he responded in a professional and humorous way."

—M. Williamson

In seeking the best possible deal, building—or suggesting you intend to build—a long-term relationship with the supplier is one commonly used technique to gain leverage. "You improve the cost of what you buy by leaving the door open for future business," Fine says.

"Vendors have to see a future in order to give you a good price," Ryan adds. "Also, if you're buying product X and can look at some of the supplier's other products, you may be able to put several products together to get a price reduction. It's a matter of being smart and shrewd, and keeping your eyes open."

One additional bit of shrewdness involves knowing the supplier's business down to the fiscal closing periods, Ryan says. "Usually near the close of a fiscal quarter or year, the marketing people will come off price to get a sale. If you can time your purchases, you can get better deals."

Large companies can often get the best of a deal by offering to serve as a reference account, particularly if the vendor is new to the field and ea-

ger to build a reputation. George Sekely, senior vice president of CSX Transportation Inc. and president of CSX Technology Inc., based in Jacksonville, Fla., did just that in 1976. He was at Canadian Pacific Rail System then, and negotiated for "the first interactive commercial Amdahl computer in the world. In those days, Amdahl was completely unknown," he explains.

Sekely had on order at the time the largest IBM mainframe available. Seeking to save \$2 million on the purchase, he told the Amdahl representative he could have the sale if he offered a price that much

lower than IBM's. Eager to break into the market, the salesman agreed. Sekely says the risk was negligible, even though the vendor was unknown. "We did our research, and we satisfied ourselves that the machine would work. We ran it with the IBM machine on-site for a couple of weeks to minimize the chances of infant mortality," he says. "Amdahl is plug-compatible with IBM, so it was not a big deal. And if Amdahl had failed, we'd have been in perfect shape to negotiate a better deal from IBM."

A manufacturer can spend as much as 70 percent of its money on goods and services, so it makes little sense to pay attention to product development and technical issues but not to the purchasing function, says *Purchasing* magazine's Morgan. Companies that get the best deals are

them, and managed to get reductions and elimination of many of the upgrade fees."

To Sekely, the art of getting the vendor to blink is straight out of Sun Tzu's 2,500-year-old classic *The Art of War*. Suppose you are dealing with two suppliers, he says, "and it looks as though you're going to buy from vendor A." To avoid being pursued by vendor B, you should tell it that you don't actually like A, he says, because then it won't make any effort to woo you. "On the other hand, if A doesn't look good at all and you think you will buy from B, then you ought to tell B that A looks really good because in that case, B will work hard to better their offer. If I'm going to choose them, I want them to go through the hoops and lower their price a little bit further." Whatever the situation, though, Sekely

Win Tips

- Prepare for negotiations. Know where you can and cannot compromise.
- Put yourself in the vendor's place and try to figure out what is important to the people on the other side of the table.
- Don't get fixated on purchase price alone. The vendor may be able to yield on other issues that can save you just as much money in the long run.
- In negotiating for services, get the vendor to share the risk by offering a bonus for superior performance.
- Use the possibility of future business, or of being a reference account, as a point of leverage.
- Watch your vendors' accounting calendars. The best deals are often made near the close of a quarter or fiscal year.
- Keep the prospect of competition alive, even with your first-choice vendor.
- Always have a plan B. Be prepared to walk away from the table if you can't win on the important points.

—M. Williamson

"Don't let your technicians negotiate. You need people who are responsible for software and service contract negotiations."

— Raymond Ryan

those that develop a sourcing strategy, he says, and part of that strategy should involve using staff dedicated to negotiating for technology.

Ryan agrees. "Don't let your technicians negotiate," he warns. "You need people who are responsible for software and service contract negotiations." General purchasing agents may be suitable for the purpose, but only if they understand the technology and issues involved and can negotiate for more than price.

Ryan tells of a recent instance in which his company upgraded its mainframe. "If we took what the vendors told us, the price of upgrading our software would have been about \$500,000; we ended up paying \$235,000," he says. The trick was to implement a sourcing strategy. "We had 25 vendors, four or five of [which] got 75 percent of our money, so we focused on the big-dollar vendors, spent a lot of time working with

stresses that it's always critical to be "scrupulously honest" with your vendor.

Ferkenhoff has found that service vendors are willing to give him more if they have more invested in the relationship. "More and more, I'm trying to negotiate an agreement to get the supplier's skin in the game. If they meet the requirements, deliver on time, come in on budget or below, there's a real win." In a recent consulting engagement, he structured the agreement at an hourly rate, with a bonus if the project met his full expectations. The consultant "knocked himself out," he says, won the bonus, and both sides walked away happy.

Perhaps the win-win strategy isn't so unrealistic after all. **CIO**

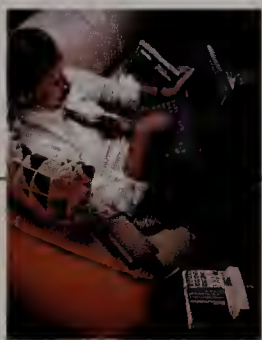
Mickey Williamson is a technical journalist based in Warwick, Mass. Her Internet address is qwertygroup@mcimail.com.

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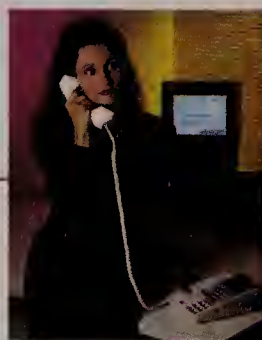
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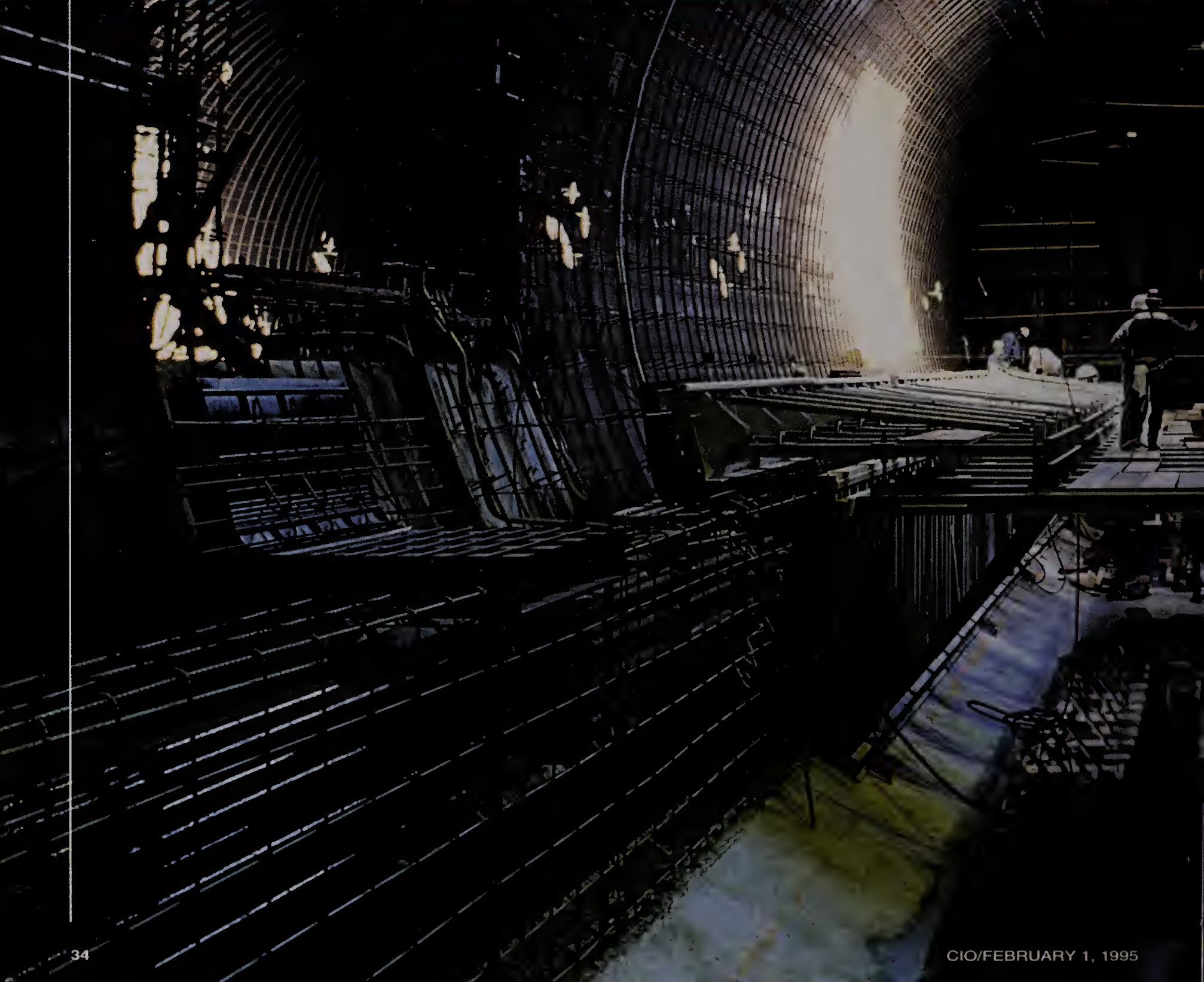
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Beneath the BIG DIG





Boston's Central Artery Project has introduced some radical techniques to American civil engineering—as well as what may be the discipline's most powerful and densely linked information environment ever

BY FRED HAPGOOD

INNOVATION RUNS MORE SLOWLY in heavy construction than in many branches of engineering, perhaps because the clients are often governments, and governments are often reluctant to invest in “unproven” technology. Still, exceptions occur: In 1985, the Massachusetts Highway Department put out a bid for a highway-construction project in which conventional techniques were rejected right from the start. More than a mile of this project was to run under and through the center of Boston, and the department had decided that the traditional approach to underground highway construction (dig a trench, build the road in the trench, roof it over) would be unacceptably disruptive. It therefore laid down as a condition of construction that the road be built with some new, unobtrusive method that would leave normal patterns of traffic or structure use undisturbed.

Editor's note: No public-works construction project of any size is without its glitches. The Central Artery Project portrayed in this story is no exception. Since this story was reported, a highly public difference of opinion has flared up between the project's contractors and Commonwealth of Massachusetts oversight agencies. The conflict concerns cost and planning issues that do not bear on the merits of the system profiled here.

Paradoxically, this level of innovation was not originally mentioned or envisioned by the client. The structure just grew, one step at a time, in response to the immense complexity of the task and certain lucky accidents of personnel and timing.

NOBODY IN THE WORLD had ever done anything like that for an eight- to 10-lane highway, let alone while weaving it through a jumble of old building foundations, subways and utilities like those packing Boston's underside. Still, contractors were found who were willing to give it a shot, and in the fall of 1985, a consortium managed by Bechtel Civil Inc., of San Francisco, and Parsons Brinckerhoff Quade and Douglas Inc., of New York, reported for work. After six years of planning, B/PB, as the manager is called, started introducing a new kit of construction techniques (which some have called "arthroscopic heavy construction") to American civil engineering in 1992.

As significant as these new methods might be, the historic contribution of the Central Artery Project could well lie in another dimension of innovation altogether: the design of the most flexible, powerful and densely linked information environment to emerge in civil-engineering IS. Paradoxically, this level of innovation was not originally mentioned or envisioned by the client. The structure just grew, one step at a time, in response to the immense complexity of the task and certain lucky accidents of personnel and timing.

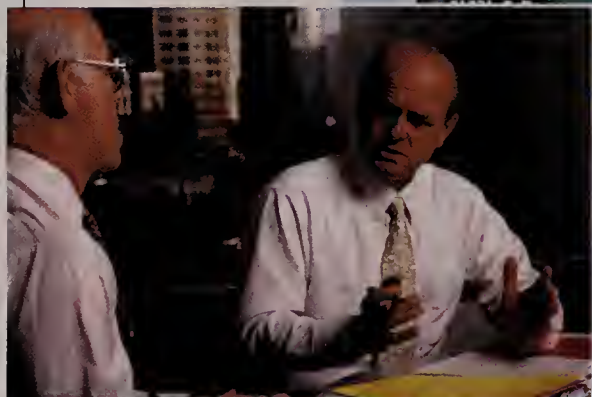
For instance, it was just luck that in the mid-1980s, the office of Secretary of Transportation was occupied by a visionary engi-

neer, Fred Salvucci. As secretary, Salvucci had the political responsibility of ensuring that the project returned as many benefits to the taxpayers of the commonwealth as possible. Most bureaucrats would have interpreted that mandate in terms of pork and patronage, but Salvucci saw other possibilities: He urged Bechtel to build a comprehensive, integrated digital map of the geological conditions and man-made structures in the Boston basin and to make the map available to anyone wishing to build downtown.

The interest coming from Salvucci's office influenced the design of the project's information systems right from the start. Project leaders made sure the systems could accept, manipulate and report the widest possible range of data types. "We scanned in thousands of drawings—utility maps, existing features, surveys, right-of-way maps, ownership maps," recalls George Baber, deputy project manager for Bechtel at the time. "Lots of these charts were decades old. Some were deteriorating so fast they barely made it to the scanner. We were like preservationists, saving the history of Boston construction."

As these documents were digitized, they were tied into a grid of street addresses and a second, more precise grid defined through global-positioning satellite technology. Spe-

PROJECT MASTER SCHEDULE



DON MARSHALL pushed for 3-D and time-sequence capabilities. This schedule shows current activity in red, future construction in yellow.

cial survey crews roved the city, filling in the holes in the maps and back-checking them for accuracy. When they were finished, Secretary Salvucci had his standard reference work, and B/PB had a system that could report the exact locations and dimensions of existing features within any set of geodesic coordinates or street addresses and to any scale.

THE NEXT STEP in defining the information system came when it was time to set the CAD standards for the project. The usual point of naming a single CAD package for all contractors and subcontractors is to assure projectwide drawing compatibility. But the example of the GIS database and the complexity of the project persuaded the engineers responsible for defining these standards, George R. Jackson and Art Schintzel Jr., that something more ambitious was called for.

In 1987, Jackson and Schintzel proposed leaping over simple CAD to a fully featured, object-oriented design language (produced by Graphic Data Systems Corp. of Englewood, Colo.). GDS supported drafting, design and a powerful document-management and -retrieval system. "Usually when you want to look at a drawing on a project, you call up document control and give them the document number," says Sergiu Luchian, projectwide engineer and client representative for the Massachusetts Highway Department. "Sometimes they want you to mail them the request. Then they fill out a work order and send the order to archives, which retrieves the document and sends it to reproduction, which makes a copy and sends it to you. You might get the mylar in three days. Or five. And that's if you know the document number.

"The other day, I wanted to compare some details in two adjoining lanes," Luchian continues. "I had the drawing of one lane and needed the other. I called up a map of the Artery Project right on my PC, clicked on the area I wanted, went to a finer map, and clicked on that. That brought me to a map where the contracts were shown in different colors. I clicked on the one I wanted and was prompted for the category of drawing (electrical, civil, structural, geotechnical, survey, architectural, mechanical and so on). I clicked



SIX YEARS OF PLANNING for Boston's Big Dig included development of a comprehensive, integrated digital map of the city's geology and architecture.

on the right discipline and there I had it—in two minutes instead of three days or a week."

Just these features alone would have been a small revolution in a field like heavy construction, where many contractors have never even used a simple CAD system. But Jackson and Schintzel were looking even further down the road. GDS is object-oriented in the sense that it can pass graphic objects through a series of application environments (detail planning, construction, inspection, warranty, maintenance, etc.), each with its own custom subset of text, data structures and algorithms.

This makes it possible to link engineering designs with the specialized databases being prepared around the project to track such things as geographical features, historical resources, complaints, mitigation commitments and rodent control. It lets managers see the



ENGINEERS can now call up complex project drawings on a PC in a matter of minutes.



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Contractors can see their part of the project in relation to others from any orientation or perspective over any period of time.

(They could walk through the earth and look "up" at the foundations of buildings overhead, for example.)

physical relationships among proposed features, existing structures and geological conditions—all to any scale and within any desired coordinates—and to remove details obscuring points of interest. "Usually when you do a redesign, you have to sit around paging through hundreds of sheets of drawings looking for the information you need," Jackson says. "GDS makes that unnecessary."

IN THE EARLY '90s, Don Marshall, the project's manager of operations and transportation, asked Jackson to enhance the GDS system even further with both 3-D and time-sequence information. "Once I was working on an underground-station project," Marshall says, "and the question arose as to whether a crane could lift a piece of equipment up through the construction at a certain point. We spent two weeks building a complete model of the station to scale to settle the point." Those kinds of questions could be expected to arise frequently on the Artery Project. The new data would give contractors a top-down orientation tool, so they

could see their part of the project in relation to others from any orientation or perspective over any period of time. (They could walk through the earth and look "up" at the foundations of buildings overhead, for example.) Marshall also expected that an animation of the historical record of a project would permit faster, less-contentious claims negotiations and settlements.

He also hoped that 3-D and time-sequence capabilities would enable them to perform what-if analyses of the construction schedule more quickly and easily. Construction scheduling entails breaking a project into "activities" of a few hundred to a few thousand man-hours and then arranging these activities into the most efficient production cycle. In the case of the Artery Project, construction scheduling runs in two tiers. The manager's scheduler keeps track of the flow of work on a macro level, pays the contractors and calculates the amount of money that needs to be raised at the next month's bond sale. (This is one of the first projects to extend just-in-time methods to financing.)

MORE THAN A MILE of Boston's Central Artery Project runs through and under the city's center. An innovative information environment is helping to minimize disruption of traffic caused by construction.



The second tier consists of the scheduling programs run by the dozens of contractors and subcontractors involved. These control material and personnel resources, making sure, for instance, that an equipment operator is working in one but not more than one location every day of his or her contract. (The project standard for both tiers of scheduling software is by Primavera Systems Inc., of Bala Cynwyd, Pa.) These tiers exchange information once a month.

At any given time, thousands of activities are running over the project as a whole. Some of these will be running ahead of schedule and some behind; some will be consuming more resources than expected and others less. Many of these deviations will have downstream effects and require (or permit) reorganization or redesign of other activities, which in turn might introduce further difficulties or opportunities.

What-if simulations are an important aid in keeping all these balls in the air. While Primavera's software supports simulations, the output format is too complex to be read

quickly without special training. Combining time-sequence information from the scheduling software with the graphic objects of GDS would let contractors evaluate schedule alternatives by simple inspection.

DURING THE EARLY '90s, Jackson and Schintzel supervised the translation of thousands of design drawings into 3-D. "Usually we just do general blocking or 'massing,'" says Schintzel. This adds color to 3-D shapes in order to express mass. "Sometimes we add finer features, like doors and windows. Occasionally we model every piece of steel." Sequence information is conveyed by the presence and absence of gross structures in the site landscape, and on a finer level by color codes representing different degrees of contract completion. An animation engine ("Walkthru") written by the principals of Jacobus Technologies Inc., of Gaithersburg, Md., is used to combine the elements of 3-D and time sequence.

"You can call up a site as it will look on the day you need a crane, drive the crane around

"You can call up a site as it will look on the day you need a crane, drive the crane around it and find a place for it to sit."

—Jeff Skolnick



Building for the Future

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After construction is completed, the Artery Project's information system will continue to evolve

Toward the end of this decade, B/PB, the consortium managing Boston's Central Artery Project, will start to turn over the project to whomever the Massachusetts Highway Department designates as the operating agency. At that point, the information system will take on two new functions: maintenance and "real-time asset management" or operations, including traffic control. (Sergiu Luchian, projectwide engineer and client representative for the Massachusetts Highway Department, cautions that planners are years away from freezing design of the maintenance and operations systems.)

In terms of maintenance, the system will allow workers to retrieve the file (including design specs, procurement data, manufacturing history, installation notes and inspection history) of every part and piece of equipment in the field—probably by waving a bar-code wand over the part and receiving output on a wireless PC.

In operations control, the system will pick up several new information inputs that might appear as overlays on the screen of the geographic information system. These new inputs will include traffic flow (determined by sensors under the highway), the calculations of traffic-modeling software, transponders carried by rescue or maintenance vehicles and personnel, and the output of 400 closed-circuit television cameras. The transponders will establish crew locations directly as blips on the traffic display/GIS screen, allowing operations control to see at a glance which team is in the best position to deal with the traffic conditions of the moment and how it should proceed. The GIS might also contribute to the material to be displayed on the several large screens that will make up a planned "motorist information system."

—F. Hapgood

it and find a place for it to sit," says Jeff Skolnick, senior development engineer at Jacobus. Walkthru supports an interference detector that will signal the contractor if his crane grazes an object, like a beam, or passes through a space some other contractor has reserved for his own activities.

The GDS system has proven especially useful in preparing presentations for the large number of lay constituencies—abutters, environmental and community groups, news organizations—that are constantly interacting with the huge project. For instance, at one point a group of abutters expressed concern that pedestrian access to their businesses would be compromised during a certain phase of the project. They were invited in and given a literal walk-through of the site over the period of concern—up and down

the sidewalks, over the streets and around the buildings—and went away reassured.

However, so far penetration of the system into the constituency Marshall hoped would benefit most—the contractors—has been slow. Partly this is a hardware issue; until recently, access to the GDS system required a relatively rare workstation, though now it has begun to move into DOS boxes through the project's local area network. It is also true that the expectation of continuous adaptation to technological change is not yet part of the mind-set of heavy construction.

Many observers suspect that the system developed for the project might help change this—that once the architecture is in place to allow every item of data in a project to enhance the utility of every other item of data, the upgrades will roll without end. Jacobus's Skolnick believes that heavy-construction information systems will soon be able to generate graphic interfaces and sequence information automatically. He points out that since graphic interfaces support a high level of interactivity (and therefore the rapid evaluation of alternatives), this development will free the software from its current job of simply recording one person's solution and enable it to initiate suggestions by presenting the results of an exhaustive search of the entire solution space of a problem. "Instead of letting the contractor find where to park the crane, the software will find every possible place where it might park and then let you choose."

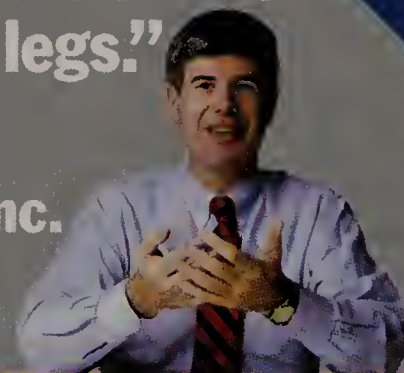
Feniosky Pena-Mora, a post-doctorate associate in the civil-engineering department at MIT in Cambridge, Mass., sees no limit to the degree of intelligence that might be built into such a system. "For example," he says, "you could have the computer track the prices of construction materials. If it saw the chance for a quick killing in the rebar market, it might calculate that the project will do better by moving up the rebar-dependent activities. So it would do the schedule reorganization and kick the proposal out onto the contractor's desk."

Marshall believes that the natural path of enhancement is for the system to move to finer and finer levels of construction, from activities of a few hundred man-hours to a few dozen. "The money is in the details," he says, so that's where the software should go. 

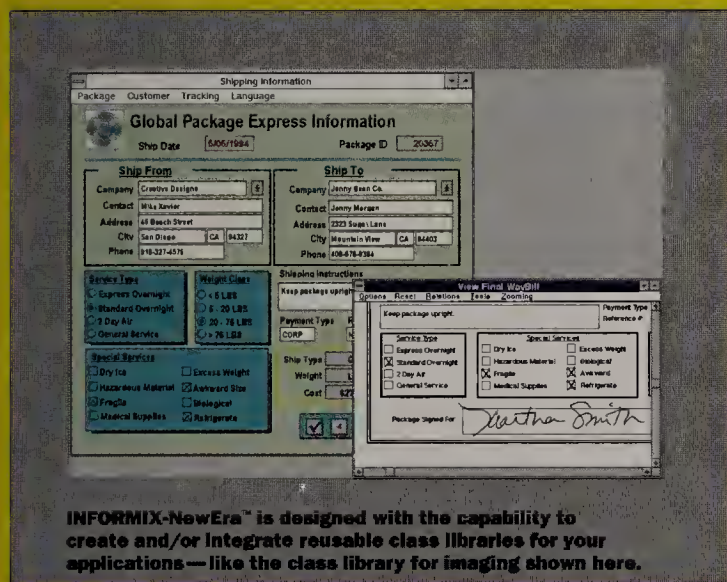
Fred Hapgood (f.hapgood@channell.com) is a Boston-based science and technology writer and the author of Up the Infinite Corridor.

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The business goal in the world of franchise operations is to leverage economies of scale in assuring consistent quality, agreeable customer experiences and top-notch operational practice among many small, widely scattered outlets. How does IT help franchisors deliver solid support to franchisees?



FRANCHISE PLAYERS

BY MICKEY WILLIAMSON

THE WHOLE IDEA OF FRANCHISING RUNS COUNTER TO human nature, says Randy Fields, chairman of the Park City Group, software developer for the franchising industry. The problem of the franchise operation is to get hundreds or thousands of individuals to present the same face to the public—to answer the telephone the same way, dress the same way, follow the same standards and procedures. “The franchise itself is based on conformity and recognition. When you walk into McDonald’s anywhere, you have a certain expectation about what you’ll find,” Fields says.

But the desire to be different is built into the human psyche. “We are programmed to be different—one from another—to behave differently and to do things differently,” he explains. “To be organizationally successful, we have to have a high degree of conformity,” Fields says, adding that the same is true of any “multiunit, geographically dispersed organization: Organizational behavior is contrary to the species.”

Fields’ wife Debbi is *the* Mrs. Fields, purveyor of chocolate-chip cookies like those you used to wish your mother could make. Mrs. Fields Cookies Inc. was the Park City Group’s first client, back when the software company was called Fields Software Group. (The name was changed in 1993 to distance the software organization from the cookie enterprise.) Now the same software that runs Mrs. Fields’ 359 franchise stores and 328 company-owned stores is available to other franchisors and chain retailers as well. Taco Bell, Burger King, Woolworth and Kmart are all Park City Group customers, using portions of the software

MAC KELTON: *reaping
the competitive benefits of
a nationwide real estate
data network*





JEFFREY FORMAN: *support in acquiring everything from office technology to new hires*

and adding more as the technology is absorbed into their organizations.

It takes a hierarchical structure to counteract the natural tendency of multiunit organizations "to fly apart," Fields says. He sees technology as the way to ease the economic burden of enforcing uniformity. "If technology is applied to this problem, there is a better prospect of both replacing cumbersome organizational systems, and at the same time empowering individuals to do what they do best within their individual areas of expertise," he says.

Franchisees, for whom use of the software is mandatory, seem to welcome the uniformity that Mrs. Fields' technology enforces. Says James Emery, owner of a franchise store in Scottsdale, Ariz., "It's fantastic. It gives you everything you need to run a small business."

Customers can get very emotional about what they eat, so lock-step conformity may be a necessity where food is concerned. But franchisors in other market areas take a less-authoritarian approach to organizing. Many are,

for the time being at least, less sophisticated about their use of information technology.

Sir Speedy, a printing and copying franchisor based in Laguna Hills, Calif., focuses on providing its more than 850 franchisees with savings on computers and software, in addition

"The franchise itself is based on conformity and recognition. When you walk into McDonald's anywhere, you have a certain expectation about what you'll find."

—Randy Fields

to printing equipment and supplies. The company negotiates with computer makers and software distributors for discounts ranging from 10 to 30 percent, according to Lynda Frank, project manager for a new online service, called SpeedNET, that furnishes

affiliates with access to online information (see related story, Page 50). Franchisees are free to purchase under these contracts or not, as they see fit.

Some do and some don't, says Ed Denn, a Sir Speedy affiliate in Renton, Wash. "Every Sir Speedy is different," he says. "There are those of us who are on top of things electronically and those who are in the Dark Ages." Although the printing franchisor makes available a hardware-software package that suits the majority of franchisees, Denn bought his own system—one at "a different level of sophistication"—to accommodate multiple concurrent users. Still, Denn says, he makes most of his purchases through the national organization. "The royalty you pay is offset by what you can save because they can negotiate better pricing for us. You'd be foolish not to take advantage of what they have to offer," he says.

Just a step up the uniformity ladder is another print-shop franchisor, Minuteman International, headquartered in Farmingdale, N.Y. Minuteman has developed a suite of proprietary applications that prepare price quotes, trigger sales follow-ups to initial customer inquiries, and help with billing, market surveys and accounting. "We did a lot of investigating before actually doing it ourselves," says Clifford Chin, business manager for the chain of about 800 affiliates. "None of the packages we saw was geared to the printing industry. Our system allows each of our store owners to get away from the office, cut out the paper work and not inadvertently price jobs incorrectly and lose money on the deal."

The Minuteman IS organization functions largely as a systems integrator, according to Chin. "We do recommend using our software, but it's not a requirement," he says. The company also offers a hardware-software package, based on Intel Corp.'s 486 processor, that affiliates can buy or lease. In addition, Chin presides over a technical-support staff that handles calls to a toll-free number and dispatches field-service technicians, at no cost to the franchisee,

“Every Sir Speedy is different. There are those of us who are on top of things electronically and those who are in the Dark Ages.”

—Ed Denn

when a problem cannot be handled over the telephone.

Jeffrey Forman, owner of a Minuteman Press store in Marlboro, Mass., praises both the quality of the franchisor's technical information and the fact that affiliates are given, but not required to follow, the company's computer advice. Forman says he likes Minuteman's software package but not the designated hardware vendor. “They told me the specifications for a computer that could run their software. I was free to do my own thing,” he notes. A license to run the Minuteman software costs about \$125 per year, Forman says, entitling the user to all upgrades and as much technical support as is necessary.

The same was true, Forman adds, when he purchased his printing equipment. Minuteman provided an equipment list but left him free to make his own arrangements if he chose to do so. “If I felt I could do a better job or get a better deal through a different arrangement than they had worked out with lenders, I was free to do that,” he says. Forman was also at liberty to ignore the equipment suggestions entirely, but he recognized that he could count on less support from Minuteman's technical-support staff if he strayed too far from the company's recommendations.

Along with advantageous prices for equipment and supplies, Minuteman affiliates can count on help in locating future stores, negotiating leases and even in hiring staff. Although he needs “less handholding” now than he did when he started out nearly 12 years ago, Forman says he still calls for corporate assistance in hiring key personnel. “I'll go through my initial interviews, and then I'll have one of their people speak to the

individual I think I'm going to hire, to give me the final OK,” he says.

Forman is one of three franchise owners involved in planning and development of the next generation of Minuteman's Management Software Systems, a fully integrated Microsoft Windows version that is scheduled for release this summer. “It will require a rewrite of the current DOS version from the word go,” he says.

Somewhere between the uniformity of a Mrs. Fields and the comparative laissez faire attitude of a print-shop franchisor is the close communication that enables brokers in a national real-estate network to participate in sales anywhere in the country. “Our strategy is to make agents and brokers more effective in what they do,” says Jim Kessler, CIO of Electronic



RANDY FIELDS: “To be organizationally successful, we [need] a high degree of conformity.”



Name: Donald R. Riley **Title:** Associate Vice-President for Academic Affairs **Company:** University of Minnesota **IT Budget:** Approximately \$37 million "Although our problems are not exactly the same as those of the major corporations, there is much overlap. *CIO* is a window to what's going on in the corporate world—one that is very helpful to me." **IT Responsibilities**

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Realty Associates (ERA), in Overland Park, Kan. Affiliates pay ERA a flat fee for every home sold, so anything the franchisor can do to facilitate sales puts money in the corporate pocket.

ERA brokers can show clients computerized photographs of homes for sale in any part of the United States. The ERA Electronic Integrated System, a multimedia affair that combines text and image databases, also provides prospective buyers with information on schools, cost-of-living comparisons and maps of neighborhoods. "Before they leave here, they have an idea of what they are going to find in their new city," says Mac Kelton, an ERA affiliate in Brentwood, Tenn., near Nashville. They can also see a photograph of the ERA broker who will meet them at the airport and help them find their new house, Kessler notes. "Anything we can do to ease the stress of moving helps our clients tremendously. It also speeds up the [sales] process," Kelton adds.

Affiliates provide the national office with photos of properties they have listed for sale, and headquarters maintains a database accessible to all franchisees. The national office also creates other kinds of software for affiliates: a sales-transaction-tracking system, for example, that eliminates the use of paper reports. One person in Kelton's office enters the details of 60 to 80 transactions each month, he says. "We could not do that much business if we were keeping our records on paper. I'd have to hire four or five more clerical staff to handle all the details and do the bookkeeping."

Based on the sales reports affiliates file, the corporate office feeds back information to show each office how effective the sales force is. There are formulas to do sales projections and information to motivate the sales force. "I can sit down with an agent and say, 'If you make one more sale this year, here's what it will mean to you,'" Kelton says. "Most people like to know where they're going, and this gives them a clear map of where they are headed."

Kelton can also compare his office's performance with that of other ERA

"Our system allows each of our store owners to get away from the office, cut out the paper work and not inadvertently price jobs incorrectly and lose money on the deal."

—Clifford Chin

offices around the country. "If you're independent, you have nobody to compare [yourself] to. This way, I don't have to wonder how I'm doing. I can tell whether I'm doing well or not," he adds.

As part of the package they buy when they become an ERA affiliate, brokers receive \$1,000 in "technology credits," which can be spent on ERA-selected hardware and software, Kessler says. ERA's electronic home-selling network, which combines the text-and-image database of properties for sale and the sales-

tracking facility, costs \$99. Options are available, including a business-management package, comparative market analysis, and third-party accounting and contact-management systems. This year, ERA introduced an electronic-mail package; broker participation is voluntary now, but it may eventually become a corporate standard, Kessler says.

Like Minuteman, ERA carries on a dialogue with affiliates interested in employing advanced technology. "We have a number of brokers who are active in telling us what they'd like to see and how they'd like to have things developed," Kessler says. "And we are actively involved in searching out new technologies that the individual broker might not know about."

Everyone at corporate headquarters is involved in technology exploration, Kessler adds. "Even our CEO regularly attends Comdex. The president of the service-center division and the CEO of our company know much more about technology than many senior information sys-

The Virtual Print Shop

Sir Speedy launches a national online service for its franchisees

The computer bulletin board, for years the playground of youthful computer hobbyists, is achieving maturity in the quick-print industry. Affiliates of the Sir Speedy printing franchisor are using local bulletin-board services (BBSs) to communicate with their customers, and Sir Speedy headquarters in Laguna Hills, Calif., has just launched a national online service to communicate with its customers, the local Sir Speedy franchisees.

Only about 350 of the 800-plus Sir Speedy affiliates are equipped for modem communications with

the national headquarters, but Lyn-da Frank, project manager for the bulletin-board service, hopes to see that number increase as the benefits of the service become known throughout the organization.

The system provides a message service and sections for software bug fixes, operating manuals and that staple of the quick printer's diet, clip art. Franchisees can dial the online service's phone number, find the text or graphics information they want and download it to their own personal computers at no charge other than the cost of the telephone call.

tems officers I've met. To me, that's the key to a successful IS strategy."

To the Mrs. Fields Cookies organization, success means no surprises and no doubts. The franchisor's ultimate objective is to help improve affiliates' profitability, says Randy Fields. That means the franchisee must have the appropriate tools and the franchisor must be informed on a regular basis about how the franchisee is doing. The Park City Group toolkit fulfills both requirements.

Once they become Mrs. Fields affiliates, franchisees sign a software-license agreement giving them the right to use Park City's proprietary software. Keith Gerson, Mrs. Fields' vice president of franchising and licensing, says the software provides franchisees with "a consultant in a box." The software, based largely on expert-system technology, includes a job-interview program that probes applicants' personalities and rates their suitability for working for Mrs. Fields. The same personality inventory is ad-

"The president of the service-center division and the CEO of our company know much more about technology than many senior information systems officers I've met. To me, that's the key to a successful IS strategy."

—Jim Kessler

ministered to applicants at all job levels, even to prospective executives, but scoring differs depending on position. "The test is multiple choice, based on responses made by the most competent individuals in our organization at all levels," Gerson explains. "In a matter of seconds after completing about 76 questions, we can know whether the person being interviewed is likely to be successful or suitable to the organization."

Then there are the scheduling and cash-sales packages, which store personnel run hourly. According to Emery, anyone can run the software after a brief session of instruction and practice. Once every hour, store personnel take cash-register readings and enter them by hand into the system. In return, they receive instructions on how many cookies, brownies and muffins to bake for sale in the next two hours. "You have to plan for two-hour segments because baking takes about 30 minutes," Emery explains. The system also sets out the work schedule for each employee hour by hour, based on the store's activity and the competencies listed for each individual worker.

Also part of the cookie franchisor's package are an equipment-troubleshooting checklist and a policies-and-procedures manual that the central office updates periodically by electronic mail. The manual can be searched by key word; it even has phonetic search capabilities, so correct spelling of the key word is not required. The sales-forecast module bases its projections on hourly receipts input over the past four weeks; it can adjust for holidays, school vacations and even special promotions scheduled by a mall's anchor store. Projections are shown both in alphanumeric and bar-graph form.

Like its counterparts in other industry segments, the Mrs. Fields organization negotiates prices on supplies (such as pre-mixed cookie ingredients) with a single manufacturer and distributor. Unlike the other franchisees, however, Mrs. Fields affiliates have no choice about where to buy or what to pay.

Each night, the franchise organization polls affiliate stores and retrieves the day's results. Franchisees pay a 6 percent royalty on sales, and there is no room for error in calculating this payment. "The system is set up so that every cookie that is baked is accounted for," says Emery. **CIO**

Mickey Williamson is a technical journalist based in Warwick, Mass. Her Internet address is qwertygroup@mcimail.com.



LYNDA FRANK: investing in long-term profitability

"It's an expense for us, not a revenue producer," says Frank. "We do things for franchisees all the time that

don't bring us revenue right away." The payoff for the franchisor comes, she explains, when the new service brings in more money for the franchisees, which pay a percentage of that revenue as royalties to the national organization.

One of the pioneers in offering bulletin-board service to his customers is Sir Speedy franchisee Ed Denn, of Renton, Wash. His customers can place print orders without ever entering the store by uploading electronic graphics files from their own computers. Denn also provides screen fonts on the BBS; customers can choose from among many type styles and download those they would like to try.

—M. Williamson



GETTING THE HOME FIRES BURNING

.....

As the reasons for telecommuting become more compelling and tales of successful trials make the rounds, CIOs have to determine their role in ensuring their companies' success

BY TRACY MAYOR

PEOPLE HAVE BEEN DISCUSSING THE PROS AND CONS of telecommuting for years, but in the last few, the Clean Air Act, the January 1994 Los Angeles earthquake and some successful corporate trials have inspired many companies to consider the option more seriously. The informal, limited experiences of professional and executive types have paved the way for organized, larger-scale projects. While IS managers may welcome a new opportunity to show off technology in its best light, they wonder, "Who's going to manage all those dial-up lines?" "Does this mean everyone needs a Pentium laptop?" "Who fixes the hardware when it breaks?" and "What about security?"

For information executives, the news from the front is good: Launching a telecommuting pilot isn't likely to put undue strain on the IS department in the short term. If your end-user services are in good shape before you begin, most of the work will come in the planning and initiation stages. Long term, IS's role will be more critical as telecommuting moves from carefully selected trials to departmentwide programs. Analysts and telework advocates agree that technologies such as integrated services digital network (ISDN), imaging and electronic data interchange (EDI) will play a key part in determining if telecommuting will be able to expand beyond its current narrow niche and encompass workers now physically tied to the office by their computing requirements.

The number of employees who work from home at least part time—and practitioners emphasize that very few people work from home full time—has increased markedly in the past year. BIS Strategic Decisions, a research firm based in Norwell, Mass., estimates that some 5.6 million workers will be laboring from home at least three days a month by year's end, up from last year's 4.5 million figure.

Companies try telecommuting for a variety of reasons, including the chance to save significantly on skyrocketing real-estate and other physical-plant costs, the need to comply with the Employee Commute Options program of the Clean Air Act (see box this page), and the opportunity to schedule employees on split shifts and other demand-driven timetables.

Some firms, like Vertex Pharmaceuticals Inc., a Cambridge, Mass., drug-research and -development company, use telecommuting to retain commute-weary employees seeking more flexibility in their schedules. About 60 Vertex research scientists and business executives telecommute to some degree, according to Brian Perry, director of information systems. "Scientists don't work set hours," he explains. "They'll disappear for days, go home and work on a paper or work on some ideas, then dial up."

Vertex is typical in several ways of the kinds of organizations currently exploring telecommuting. The company is small—160 employees total—and remote employees either use their own equipment at home or are furnished with a system from the company; some are issued a single laptop computer for both home and office use. Employees dial into either a terminal server or the firm's AppleTalk network over a standard-issue high-speed modem, at least 14,400 baud. Employees can't gain access until they've entered a password, a personal identification number and a serial number from their SecurID, a "smart card" manufactured by Security Dynamics, also in Cambridge.

Vertex's IS department preconfigures and tests the machines they send home and conducts a brief training session on the remote software. Network lines are monitored automatically, and the help line is available to remote users 24 hours a day. However, once people become accustomed to the security and dial-in systems, Vertex experiences only a very few telecommuting-related help calls—"maybe one or two problems per week, which is almost zero," says Perry.

How can IS managers ensure their organizations will reach Vertex's level of telecommuting success? The answer in many cases is teamwork. To be sure all the technical bases are covered, CIOs must know what the issues are from other perspectives as well. "Team up with human-resources, real-estate, physical-plant people...and line managers in the groups where this is going to work," advises Gil Gordon, principal at Gil Gordon Associates, a Monmouth Junction, N.J., consultancy that specializes in telecommuting.

While managers from other areas wrestle with issues such as sick days, injury liability, union representation and the reallocation of office space, CIOs should be setting up—or better yet, refining—standards for hardware, communications, security and support. IS should have "a major role in the whole program," says Martin Pospeshil, manager of alternative officing strategies in AT&T's Global Real Estate division, in Basking Ridge, N.J. (Pospeshil himself works out of his home in Buffalo Grove, Ill.) He ticks off a list of initial concerns: "Helping people get set up in their home environment, keeping the system running, [providing] ongoing help-desk and on-site service at the person's home."

Pospeshil knows whereof he speaks: Nationwide, some 30,000 AT&T management employees, or an impressive 12 percent of the company, telecommute or work within the "virtual office" paradigm (see box, Page 58).

Although technology can be a significant enabler, the advent of telecommuting does not instantly lead to a Powerbook in every pot. "One of the myths of telecommuting is that it's all high-tech, but it's very low-tech in some cases," says Gordon. "[Some] people save their keyboard time for the office" and catch up on reading or phone calls at home.

"The first thing managers worry about is, 'How am I going to get computer access to all those people?'" says Jack Nilles, author of

Making Telecommuting Happen (Van Nostrand Reinhold, 1994) and president of JALA International, a Los Angeles consultancy. "The answer is, initially, not everyone is going to need it. [Studies indicate that] 25 to 30 percent of telecommuters don't need a computer at the beginning." As the technology needs of teleworkers grow, however, IS increasingly needs to exert some measure of control over hardware and remote connections. "Standardization of your PC and the rest of your network is critical," says Ed Glister, senior project



A Congressional Driver

According to the Clean Air Act, one of the main reasons for urban air pollution is a rapid increase in the number of miles being traveled by cars and light trucks. In a 1990 amendment to the act, Congress created the Employee Commute Options (ECO) program. This mandated that, by 1994, companies with more than 100 employees in any one of 10 specified metropolitan areas with severe pollution had to develop a plan to reduce solo driving among their employees. The plans must be designed to achieve a target increase in vehicle occupancy—generally 25 percent above the average for that area before the ECO went into effect—by 1996. One of the incentives employers are using to meet these requirements is telecommuting from home.



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manager for the New Customer Service System project at Con Edison in New York. Con Ed recommends that its home workers use Dell PCs in a company-standard configuration. "If you control the PC, then problems [will be] only in making the initial connection and ensuring you have the right level of technical support." Other managers say that allowing or even encouraging teleworkers to use their own home-office machines isn't necessarily a problem, provided the company establishes a clear policy stating who will fix the machine when it breaks.

When it comes to modems, even companies that are relatively freewheeling with hardware tend to issue their own approved modems to users—and the faster, the better. Others, like Con Ed and Empire Blue Cross & Blue Shield in New York, both of which are testing a telecommuting imaging system from Sigma Imaging Systems Inc., find nothing less than high-speed ISDN is fast enough to maintain productivity levels.

The software used for remote access is where things start to get tricky. "Telecommunications software is the number-one problem" for home workers, says Nilles. What's missing is ease of use, he explains. Up until now, telecom software has been notoriously—some would even say perversely—character-based and cryptic. "Most people who are not computer freaks seem to work better with a [graphical] environment," he says, "but [for that] you need a fast modem or ISDN."

The modem-telecom software combination is likely to generate the highest number of calls to the help desk because it's often difficult to diagnose what exactly is causing a failed connection. "It could be the modem or the software, the phone line could be bad, you could have call-waiting disrupting the line," says Don Paiva, director of regional information services at the John Hancock Managed Care Group in Boston. "We've had frailties in the modems,...and communications software just compounds the problem." About 1,500 of the company's traveling and home workers have the ability to remotely access the firm's SPS account management and sales software from Saratoga Systems Inc. of Campbell, Calif., which has communications capabilities built into it.

Paiva tries to head off problems the way most managers do—with standards and training. Companies should standardize on a single communications package; train users on the software while they're still in the office, so they can ask questions face to face; and provide home workers with as many preset dialing scripts as possible to minimize their interaction with the software.

Few information systems departments are willing to embark on a telecommuting program without some degree of extra security. Some companies simply maintain a file server that's separate from the main-frame housing sensitive data. Others use call-back modems, which require users to enter a code and hang up; if the code is correct, the modem dials the caller back at a preauthorized number only and establishes a connection. Still others, like Vertex Pharmaceuticals, opt for a "smart card" system that equips users with a dynamic password that changes every 60 seconds.

Bill McGuire, communications services analyst III for Sprint/United Telephone of Florida, in Winter Park, administers a remote-access control system manufactured by LeeMah DataCom Security Corp., of Hayward, Calif. A LeeMah hardware device resides between Sprint's dial-up modems and the public switched telephone network, in effect deterring hackers by making it impossible for outside callers to determine if

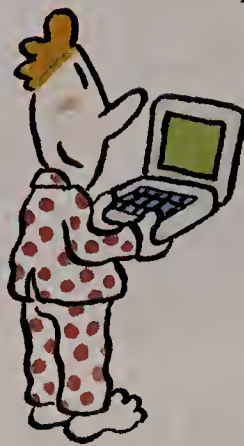
they've reached a voice or data line. More than 1,500 Sprint employees are assigned LeeMah passwords, and some 300 users are issued InfoKeys, a pager-sized hardware device that handles mobile users' end of the challenge/response process.

As the popularity of telecommuting grows among employees, and as the Clean Air Act continues to take hold, companies that never had formal programs in place will likely find it necessary—and advantageous—to begin tracking their work-from-home employees. "You

don't need a program to obtain the benefits [of telecommuting]," observes Raymond Boggs, director of small business and home office research at BIS Strategic Decisions, "but you need a program to quantify the benefits, so you can say, 'We reduced square footage by such and such an amount,' and so on."

The large California law firm of Gray Cary Ware & Freidenrich typifies the kind of company moving from an ad hoc to a more formalized telecommuting program. Stephanie Owens, telecommuting program manager in the firm's Palo Alto office, explains that since 1991, the firm has offered some degree of support to employees—primarily lawyers—who are set up to access the network remotely on an unscheduled, part-time basis.

Now Gray Cary Ware has joined the Smart Valley Telecommuting Project, a nonprofit consortium dedicated to developing a methodology for establishing telecommuting in California's Silicon Valley. For a fee based on participating companies' revenues, Smart Valley provides organizational and technical guidelines for building a formal work-from-home project with measurable ben-



The Manager Barrier

According to the Conference Board in New York, while more than 70 percent of 155 companies surveyed offered telecommuting options to their employees, less than 1 percent of the employees took part. The reason given: managers' mistrust that unsupervised telecommuters could be as productive as in-office staff.



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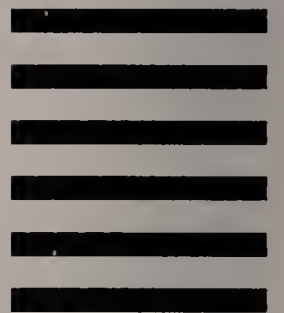
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efits. The seven companies involved in the project keep problem logs, survey participating employees and compare notes with each other. The results will be used to refine the guidelines into a handbook that will be distributed to other companies in the valley.

"The Smart Valley project is a way for us to participate in the pilot and refine our own program at the same time," says Owens. "The pilot will help us...determine if we should target another kind of position," aside from attorneys, to become telecommuters.

Finally, if formalizing a telework program seems to be more trouble than it's worth, you might want to think again. Consider the experiences of a large East Coast communications firm. The company's unmonitored but ever-growing telecommuting movement is wreaking havoc on the IS department, according to one IS professional at the company, who asked not to be named. "They're putting people out there to telecommute, but we're not notified," says the source. "There's no way of knowing when they add people, and eventually we won't have enough [dial-up] lines to support them. We get calls; people say, 'I'm a telecommuter,' but they don't have anything.... [They don't know] how to set up the PC, the software, the modem, [or] the procedures for dialing in." Currently, more than 1,000 users are authorized for some kind of remote access.

As telecommuting moves out of the pilot stage, it's becoming clear that the work-from-home movement isn't exactly egalitarian. With some large, notable exceptions, companies that support telecommuting are overwhelmingly small—less than 100 employees—and the workers who telecommute are primarily middle and upper managers who perform a variety of tasks and are accustomed to little direct supervision.

But for telecommuting to truly have a financial and environmental impact long term, the movement must encompass a greater number of workers from a wider variety of jobs. In particular, workers who perform such tasks as data entry, customer service or transaction processing are often far down on the list of candidates for telecommuting. This is due in part to corporate culture: Some companies just don't trust their rank and file to be as productive at home. (This issue generally falls under HR's purview.)

Of more concern to IS is that the applications used by these employees tend to be more complicated. Workers who process claims all day every day need the same technology at home as they have at the office. This makes telecommuting a much more daunting proposition.

Emerging technologies can help. New York's Con Ed and Empire Blue Cross are both testing an at-home version of imaging software from Sigma Imaging that lets transaction-heavy workers telecommute.

Empire Blue Cross is providing Sigma's OmniDesk HomeWorkstation imaging software to home-based claims processors, while Con Ed equips some of its customer-service representatives with the system. Calls and forms are automatically routed to home workers, just as they are at the office.

Without ISDN's 64Kbps transmission speeds, says Donald Morchower, Empire's senior vice president and chief information officer, the imaging system would be impossible to implement. "We needed to work with ISDN, but not all RBOCs have the technology," he says.

In the past, says Con Ed's Glistler, the cost was too high, but "the economics are changing with the ever-growing presence of ISDN voice and data lines." Providing these transaction-heavy workers with a system at home allows Glistler to do something that he could never accomplish in the office—establish split work shifts. "We can increase staffing capabilities during the course of the day," depending on demand, he explains. Glistler can have a teleworker answer phone calls during two peak hours in the morning and two in the afternoon, a schedule that a commuting employee would find unacceptable.

AT&T's Pospeshil says the question of including a variety of workers is partly one of technology and partly one of corporate culture. "We have really tried to open up that whole spectrum of the types of workers. We haven't limited ourselves to saying one kind of worker can do this and [others] can't."

On the other hand, he admits, cultural forces are strong. "Since the industrial revolution, we've been working 9 to 5 or 8 to 5. That's a culture we've been working with for a long time. Now management has to change its paradigm." **CIO**

Tracy Mayor is a freelance writer and editor based in Beverly, Mass.



The Fruits of Home Labors

With some 30,000 employees working remotely, AT&T must have some compelling reasons for supporting telecommuting. To illustrate the kind of payback the company is seeing, Martin Pospeshil, manager of alternative officing strategies in AT&T's Global Real Estate division in Basking Ridge, N.J., offers the following breakdowns: The Branch Network Sales division has realized a 15 to 20 percent increase in customer contact time by setting up its salespeople in a "virtual office," and it has saved \$21 million in real-estate costs since the program's inception in early 1991. And the Business Communications Services division estimates that for every dollar it spends to set up someone in a telecommuting situation, it saves \$2 in real-estate costs.



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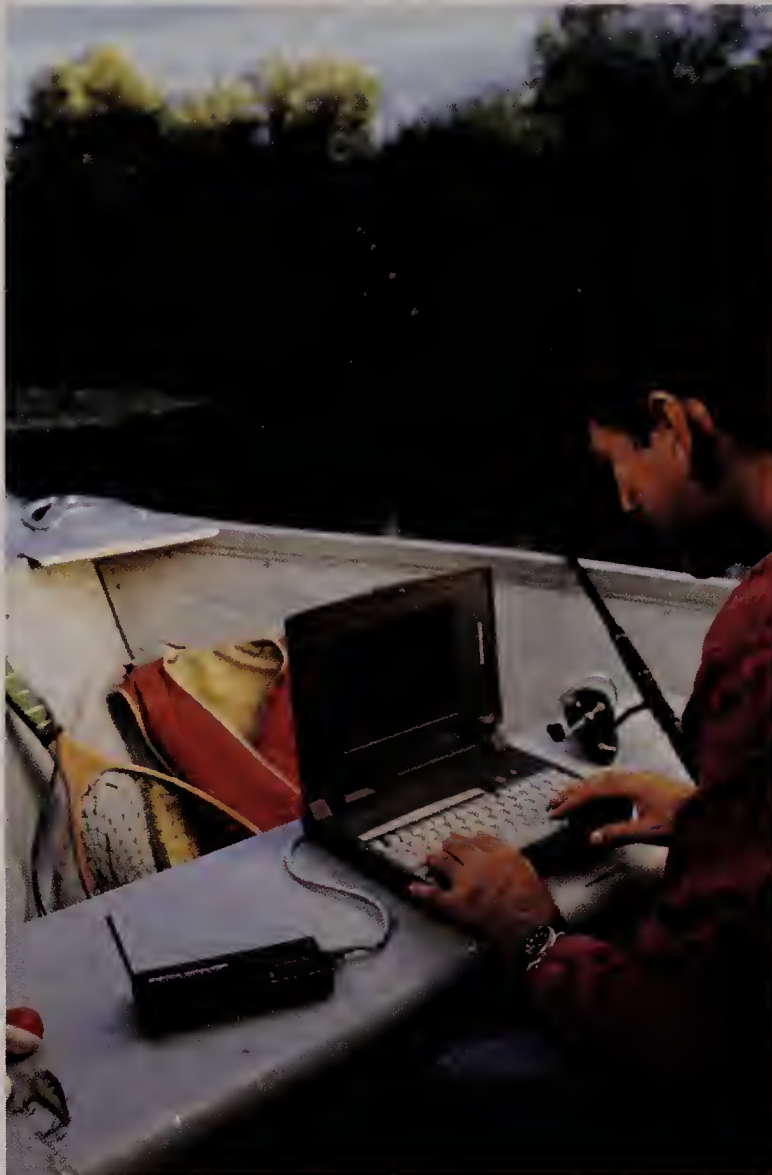
Fishing Online

A bad day of fishing can be a good day of work if you keep in touch with the office using a laptop and wireless modem. PocketPlus, a portable wireless modem from Sierra Wireless Inc., plugs into the serial port of any Macintosh- or Windows-based laptop, allowing it to go anywhere with the business traveler—even to a dinghy at 6 a.m.

Small enough to fit in the palm of your hand, PocketPlus runs on rechargeable batteries and uses a cellular transceiver to send and receive information at top speeds over cellular and public telephone networks. Onscreen icons alert users when battery and cellular-signal levels are low.

PocketPlus runs at 14,400 bits per second V.32bis and V.17 fax over circuit-switched cellular and wireline public switched telephone network (PSTN); where possible, it runs at 19,200 bps cellular digital packet data (CDPD). Sierra Wireless will eventually offer LAN access software that will allow remote users to run LAN client software in all modes.

List price is \$1,195. For more information, call Sierra Wireless in Richmond, British Columbia, at 604 231-1100.



The Return of the Middleman

Lack of access to the corporate database may be a thing of the past for telecommuters. On-the-road workers can now connect to corporate networks and access database information quickly with Oracle in Motion from Oracle Corp. The product's client-agent-server architecture lets Microsoft Windows-based laptop computer users access critical corporate information via wireless networks, LANs and phone lines.

Mobile workers typically rely on low-speed phone lines or wireless networks, so requests for database information have been hindered by the long intervals required at both ends of the connection. With Oracle in Motion, agents that reside on the corporate network and have high-bandwidth access to data servers act on behalf of the mobile client. The agents serve as middlemen, instantly transmitting a remote user's information request to the data server. When the information is found, the agent software automatically transmits the data back to the mobile worker's computer; if the computer is disconnected, the information will appear when the user reconnects. Oracle claims that Oracle in Motion overcomes speed and reliability problems and makes it possible for Windows-based laptop computers to access corporate information thousands of miles away.

Oracle in Motion agents can access data from a broad range of sources, including Oracle databases, electronic mail interfaces and Unix services, as well as both flat and relational databases. Pricing begins at \$600 per user. The product runs on Microsoft Windows 3.1 and requires 8MB of RAM and 3MB of disk space. A Sun workstation is needed to connect with a gateway. For more information, call Oracle Corp. in Redwood Shores, Calif., at 800 ORACLE 1.

Reusable Software

Software developers yearning to cut development costs and improve reliability can begin tackling both problems at once through reuse engineering. RPM 1.2, Extended Intelligence Inc.'s reuse process manager, provides a customizable environment for defining, measuring and practicing reuse-driven software development.

Both RPM and the concept of reuse engineering, a multimedia-based methodology for developing reusable business applications, were developed by consultant Carma McClure, whose research suggests that reusable software is much more reliable and less expensive to put together and maintain than new software.

Designed to simplify software reuse, RPM teaches the methodology of reuse engineering and leads the user through the process step by step, defining the techniques, deliverables, guidelines, tools and metrics of reuse. The product helps locate software redundancies and instructs users how to eliminate them. It also outlines the complexities of a project and calculates how much reusing software will save in terms of both money and time. Other product features include domain analysis and reuse library creation.

RPM runs on Windows and OS/2 and operates on a standalone PC, LAN or WAN. Pricing starts at \$35,000 for a project license; a corporate license costs \$98,000. For more information, call Extended Intelligence in Chicago at 312 346-5245, Ext. 360.

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A Landmark System

An archaic process and mountains of paper were obstructing Norfolk Southern's ability to sell or lease its land. Thanks to a combination of reengineering and IT, the firm has found real-estate relief.

Until recently, when Norfolk Southern Corp.'s real-estate agents wanted to sell or lease some of the firm's land, they had to battle an archaic, convoluted transaction procedure, a mountain of paperwork and the legacy of Civil War Gen. William Tecumseh Sherman. Interested buyers sometimes had to wait more than two years before closing a deal; not surprisingly, some gave up in frustration.

Norfolk Southern maintains land holdings worth roughly half a billion dollars along its rail lines. Besides generating revenue in their own right, they are a source of potential new business for the railroad: Their close proximity makes the land attractive to many buyers and lessees. When it comes to selling or leasing the land, though, the company, which has general offices in Roanoke and Norfolk, Va., and Atlanta as well as six regional real-estate offices, can have more than 20 departments at separate sites involved. Critical documents such as environmental reports and property valuations are often widely dispersed, so locating them all could be daunting.

Adding to the chaos: Over half the land deeds dated from the pre-Civil War era, many of them the sole surviving copies. Numerous public copies burned with courthouses during Sherman's march to the sea in 1864-65, so if a document

was difficult to locate or read, another copy was not always available.

Property-transaction procedures evolved during the company's 167 years without much coordination. A paper file would travel from department to department until all the necessary pieces had been included. "There was no way to relate the small islands of information that existed" in the various departments, says Tom Bruce, director of systems for properties. "We knew we needed a central relational database."

But the firm recognized that reengineering the process was also critical. In late 1993, it hired Systems Techniques Inc., an Atlanta consultancy that offers a method for enterprise reengineering called CONCUR.

"[The consultant] brought together in one city individuals from every department that had anything to do with real estate," Bruce says. With the goal of streamlining the transaction process, three intensive sessions were held over a five-month period. "For the first time, all the departments became aware of how the other departments use the data they prepare."

Systems Techniques personnel entered improvements gleaned from the sessions into a proprietary program that speeds creation of systems-design documents and acts as a front end to CASE development tools. The basic software was completed last September.

The new Real Property Manage-

ment System (RPMS) includes a relational database that employees tap into via a wide area network; agents can dial in remotely. It also includes a geographic information system, as well as some 14,000 maps with relevant valuation, environmental and other data. The railroad hired MRP Design Group of Marietta, Ga., to scan old maps and documents; Norfolk Southern employees enter new ones as they come in.

Transactions are now fully automated and can be routed to necessary departments without any paper. Multiple people can work on a transaction at the same time, and a task list containing the necessary steps guides them through the process.

Although it's still too early to measure any effect on the company's sales, productivity has increased, Bruce says. Leases are executed in 30 days—a vast improvement over the average of several months previously—and sales can also be completed in about a month.

RPMS is now used for other purposes as well, including preserving rare deeds and tracking properties. The result: Norfolk Southern can manage its holdings better.

—Peter Fabris

VITAL STATISTICS

Organization: Norfolk Southern Corp., Norfolk, Va.

Application: Automated real-estate transaction system

Sponsors: Kathryn McQuade, vice president of internal audit, and Tom Bruce, director of systems for properties

Technologies: Relational database developed with Visual Analyst and ERWIN using Microsoft SQL Server on Windows NT advanced servers and Gupta's SQLBase on Novell NetWare; WordPerfect Office; WAN using Cabletron hubs with CrossComm routers; MDI Optical Jukeboxes by Microdesign International; OptiDoc imaging application by Advanced Technology Services; GIS custom developed with MapInfo by Keir Consulting of Toronto; IBM ThinkPads

Scope: Over 200 users in more than 20 departments

Objective: To streamline the property transaction process

Payoff: Time to make property sales cut from about two years to 30 days; time to complete leases cut from several months to 30 days; increased productivity

Value Added: System also used for other purposes such as tracking properties and document preservation

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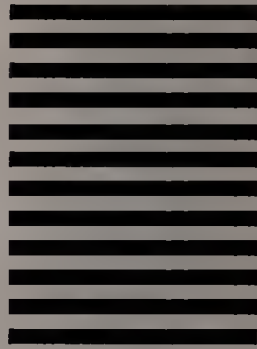
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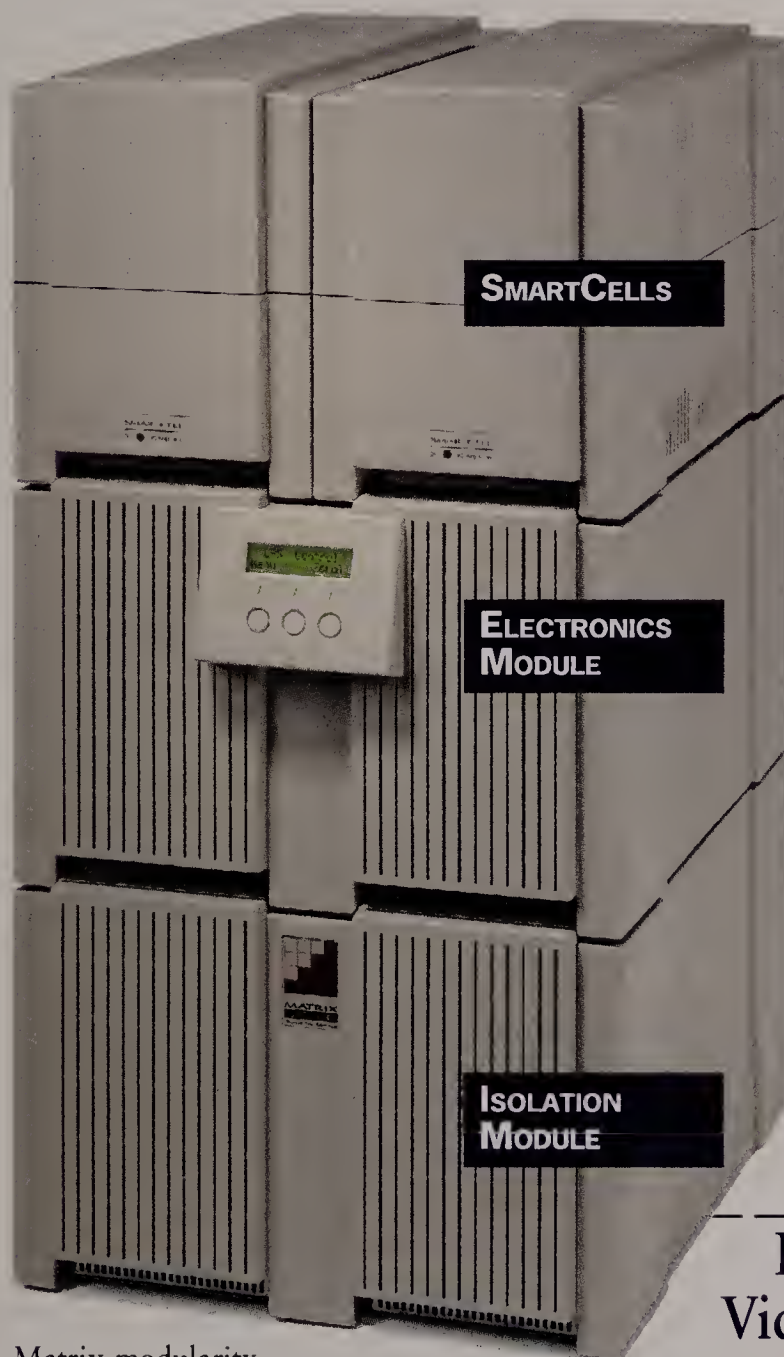
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In contrast, the Matrix™ "100% Uptime" design isolates any problems to their 'block' which can be diagnosed and hot swapped-out while the protected system stays up and reliable. No downtime. No service delays. No unnecessary risk. The fact is, Matrix delivers plug-and-play reliability no other UPS can match.

Matrix modularity means low operating and lifecycle costs

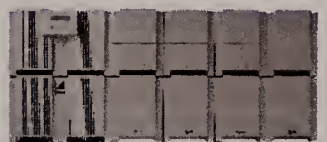
When you're rightsizing to conserve cash, the last thing you need is a UPS that wastes it.

Small footprint and low weight (each module can be shipped overnight) means Matrix can be hot-swapped out by even untrained personnel without the cost or delays of a service call.



3000 and 5000 VA protect up to 22 servers or 2 midrange systems

■ Hot-swappable modules for 100% uptime, 60% lower lifecycle costs



■ Microprocessor-controlled, zero-maintenance SmartCells end expensive service contracts. For more runtime, simply add SmartCells.

■ SNMP support and automatic server shutdown (for NetWare, UNIX, NT, OS/400, VAX, Sun and more) protects data, lowers LAN support costs.

■ Environmental and power monitoring provides "glass room" level security.

■ Two-year warranty, \$25,000 Lifetime Equipment Protection Guarantee (see details)

Free Video!



Simply fax us your business card and tell us which brand of UPS you currently use and your free Matrix UPS video will be sent straight away.

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Matrix modularity doubles expected battery life, saving you replacement costs, and operates at 93% efficiency, so you save electricity and cooling costs as well. In fact, over a 5 year lifecycle, Matrix costs up to 60% less than same-sized UPSes... savings you can't afford to ignore.

Fax for your free video!



Hold on to the things you value

We are born with the instinct to hold on to the things we value. This has served us well when we first entered the world, as each day we encountered new experiences. This same instinct serves us well today, in the ever-changing world of computing.

So when it comes to developing Client/Server, why is it that many urge you to throw away the business systems which are serving you well, in favor of adopting some completely new proprietary "paradigm"? And sure enough, when the world changes again tomorrow, you know that these same people will be urging you to start all over again.

The reality is that COBOL remains the only language that consistently delivers large-scale, mission-critical applications at the enterprise level. The people who know business and who know programming are the COBOL developers in your shop. At Micro Focus, we're committed to extending the value of your systems, people and data. We have the tools for you to evolve your existing host based applications to 2-tier or 3-tier architectures without forsaking your traditional IS values of resilience and integrity.

You need AD tools to help you preserve your assets whilst meeting and exceeding the needs of your user departments. Micro Focus lets you hold onto the things you value by giving you tools for renovating your precious business logic, for adding GUIs, transaction processors for re-hosting and downsizing together with scaleable data management systems for developing and deploying enterprise-wide Client/Server applications.

If you place value in the systems you've already created, but want to build on them, evolve them to give your users new levels of responsiveness why not give the folks at Micro Focus a call on **800-MF-COBOL Ext. 1202** and ask for our brochure "**The Changing World of Business Computing 95**" and see how we can help you to leverage the power of your existing IS strengths to move your enterprise into the future.

MICRO FOCUS®

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